

DSP

Quarter 2, 2009
SG1004Q22009 Rev 0

56800 FAMILY

56F800 Series General Purpose 16-Bit Fixed Point *Note*

Applications	Development Tools	Benefits
Motion Control <ul style="list-style-type: none"> Smart appliances Environmental controls Instrumentation 	Refer to <i>Development Tools</i> beginning on page 15.	Precise programming of drive waveforms allows control over power consumption, reducing noise and other forms of energy usage. Provides either vector or vectorless control depending on application need and motor type; hybrid controller type can be selected to match exact design requirements. Distortion correction to assure waveform purity.
Industrial <ul style="list-style-type: none"> Uninterruptable power supplies Noise cancellation/suppression Temperature control HVAC Inverters and AC-to-DC conversion Lighting Automation 	Refer to <i>Development Tools</i> beginning on page 15.	Provides specific I/O and memory tailored to the design need. Capabilities range from lowest cost part for sensorless speed-control algorithms to parts having extended memory and I/O suitable for high-end systems. Has extended PWM and ADC modules, as well as low-cost Boot Flash, for all types of motor-control, conversion, and automation requirements. High number of MIPS allows control of each axis in multi-axis systems.
Transportation <ul style="list-style-type: none"> Fuel management system Proximity sensors Airbags Traffic light control Engine management and control <ul style="list-style-type: none"> Knock detection Aircraft, automotive, marine 	Refer to <i>Development Tools</i> beginning on page 15.	CAN (Controller Area Network) protocol designed to be used as a vehicle serial data bus, meeting the specific requirements of real-time processing and reliable operation within a vehicle's EMI environment. It is extremely cost effective, while still providing the wide bandwidth needed for variety of transportation-related needs. The 56F805 and 56F807 provide dual motor control and full dual motor control, respectively, for high versatility.
Instrumentation <ul style="list-style-type: none"> Medical Scientific Servo controllers 	Refer to <i>Development Tools</i> beginning on page 15.	Excellent choice for position control in applications using AC induction and synchronous PM motors. These controllers can be used for low-end position control, vector control, and sensorless vector control. Extended CAN (Controller Area Network) for advanced applications. High MIPS for performance control of multi-axis systems. Allows for multiple fault inputs. High waveform purity is achieved by constant distortion correction.

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability. Dolby and DTS Software Licenses are Required.

56800E FAMILY

56F8300 Series General Purpose 16-Bit Fixed Point *Note*

Product	Performance	Flash/RAM (KB)	Off-Chip Memory Expansion (EMI)	Peripherals	Packaging	Additional Information
MC56F8322VFA60 MC56F8322VFAE	60 MHz 60 MIPS	48/12	n/a	2 SPI, 2 SCI, 2 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers, FlexCAN	48-pin LQFP 48-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, temperature sensor and up to 21 GPIOs.
MC56F8322MFA60 MC56F8322MFAE	60 MHz 60 MIPS	48/12	n/a	2 SPI, 2 SCI, 2 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers, FlexCAN	48-pin LQFP 48-pin LQFP*	Extended (-40°C to 125°C) MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, temperature sensor, and up to 21 GPIOs.
MC56F8323VFB60 MC56F8323VFB6E	60 MHz 60 MIPS	48/12	n/a	2 SPI, 2 SCI, 2 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers, FlexCAN	64-pin LQFP 64-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, temperature sensor, and up to 27 GPIOs.
MC56F8323MFB60 MC56F8323MFB6E	60 MHz 60 MIPS	48/12	n/a	2 SPI, 2 SCI, 2 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers, Decoder, FlexCAN	64-pin LQFP 64-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, temperature sensor, and up to 27 GPIOs.
MC56F8335VFG60 MC56F8335VFG6E	60 MHz 60 MIPS	80/12	n/a	2 SPI, 2 SCI, 4 ADC, PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8335MFG60 MC56F8335MFG6E	60 MHz 60 MIPS	80/12	n/a	2 SPI, 2 SCI, 4 ADC, PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	128-pin LQFP*	Industrial (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8345VFG60 MC56F8345VFG6E	60 MHz 60 MIPS	144/12	n/a	2 SPI, 2 SCI, 4 ADC, PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8345MFG60 MC56F8345MFG6E	60 MHz 60 MIPS	144/12	n/a	2 SPI, 2 SCI, 4 ADC 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	128-pin LQFP 128-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs,

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*This package is RoHS compliant.

56800E FAMILY (continued)

56F8300 Series General Purpose 16-Bit Fixed Point ^{Note} (continued)

Product	Performance	Flash/RAM (KB)	Off-Chip Memory Expansion (EMI)	Peripherals	Packaging	Additional Information
MC56F8346VVFV60 MC56F8346VVFVE	60 MHz 60 MIPS	144/12	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8346MFV60 MC56F8346MFVE	60 MHz 60 MIPS	144/12	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	144-pin LQFP 144-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8347VPY60 (LQFP) MC56F8347VPYE (LQFP) MC56F8347VFFE (MAPBGA)	60 MHz 60 MIPS	144/12	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	160-pin LQFP 16-pin LQFP* 160-ball MAPBGA*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.
MC56F8347MPY60 MC56F8347MPYE	60 MHz 60 MIPS	144/12	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	160-pin LQFP 160-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.
MC56F8355VFG60 MC56F8355VFGVE	60 MHz 60 MIPS	280/20	n/a	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8355MFG60 MC56F8355MFGVE	60 MHz 60 MIPS	280/20	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	128-pin LQFP 128-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8356VVFV60 MC56F8356VVFVE	60 MHz 60 MIPS	280/20	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8356MFV60 MC56F8356MFVE	60 MHz 60 MIPS	280/20	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	144-pin LQFP 144-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8357VPY60 (LQFP) MC56F8357VPYE (LQFP) MC56F8357VFFE (MAPBGA)	60 MHz 60 MIPS	280/20	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	160-pin LQFP 160-pin LQFP* 160-pin MAPBGA*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.
MC56F8357MPY60 MC56F8357MPYE	60 MHz 60 MIPS	280/20	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, FlexCAN	160-pin LQFP 160-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.
MC56F8365VFG60 MC56F8365VFGVE	60 MHz 60 MIPS	576/36	n/a	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, 2 FlexCAN	128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8365MFG60 MC56F8365MFGVE	60 MHz 60 MIPS	576/36	n/a	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, 2 FlexCAN	128-pin LQFP 128-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 49 GPIOs.
MC56F8366VVFV60 MC56F8366VVFVE	60 MHz 60 MIPS	576/36	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, 2 FlexCAN	144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8366MFV60 MC56F8366MFVE	60 MHz 60 MIPS	576/36	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, 2 FlexCAN	144-pin LQFP 144-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 62 GPIOs.
MC56F8367VPY60 (LQFP) MC56F8367VPYE (LQFP) MC56F8367VFFE (MAPBGA)	60 MHz 60 MIPS	576/36	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, 2 FlexCAN	160-pin LQFP 160-pin LQFP* 160-ball MAPBGA*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.
MC56F8367MPY60 MC56F8367MPYE (LQFP)	60 MHz 60 MIPS	576/36	Yes	2 SPI, 2 SCI, 4 ADC, 2 PWM, COP, PLL, 2 Decoders, 4 Quad Timers, 2 FlexCAN	160-pin LQFP 160-pin LQFP*	Extended (-40°C to 125°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 76 GPIOs.

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56800E FAMILY (continued)

56F8300 Series General Purpose 16-Bit Fixed Point ^{Note} (continued)

Applications	Development Tools	Benefits
Motion Control <ul style="list-style-type: none"> Smart appliances Environmental controls Instrumentation 	Refer to <i>Development Tools</i> beginning on page 15.	Precise programming of drive waveforms allows control over power consumption, reducing noise and other forms of energy usage. Provides either vector or vectorless control depending on application need and motor type; DSP type can be selected to match exact design requirements. Distortion correction to assure waveform purity.
Industrial <ul style="list-style-type: none"> Uninterruptable power supplies Noise cancellation/suppression Temperature control HVAC Inverters and AC-to-DC conversion Lighting Automation 	Refer to <i>Development Tools</i> beginning on page 15.	Provides specific I/O and memory tailored to the design need. Capabilities range from lowest cost part for sensorless speed-control algorithms to parts having extended memory and I/O suitable for high-end systems. Has extended PWM and ADC modules, as well as low-cost Boot Flash, for all types of motor-control, conversion, and automation requirements. High number of MIPS allows control of each axis in multi-axis systems.
Transportation <ul style="list-style-type: none"> EPAS Electromechanical/Hybrid Braking Active Suspension Automatic Gearbox/Transmission Fuel management system Proximity sensors Airbags Traffic light control Engine management and control <ul style="list-style-type: none"> Knock detection Aircraft, automotive, marine Electronic valve actuation 	Refer to <i>Development Tools</i> beginning on page 15.	CAN (Controller Area Network) protocol designed to be used as a vehicle serial data bus, meeting the specific requirements of real-time processing and reliable operation within a vehicle's EMI environment. It is extremely cost effective, while still providing the wide bandwidth needed for variety of transportation-related needs. The 56F834x and 56F835x provide dual motor control and full dual motor control, respectively, for high versatility. The 56F8300 Series enables lower overall system costs by including several built-in safety features that are unique among devices in its class.
Instrumentation <ul style="list-style-type: none"> Medical Scientific Servo controllers 	Refer to <i>Development Tools</i> beginning on page 15.	Excellent choice for position control in applications using AC induction and synchronous PM motors. These chips can be used for low-end position control, vector control, and sensorless vector control. Extended CAN (Controller Area Network) for advanced applications. High MIPS for performance control of multi-axis systems. Allows for multiple fault inputs. High waveform purity is achieved by constant distortion correction.

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56F8100 Series General Purpose 16-Bit Fixed Point ^{Note}

Product	Performance	Flash/RAM (KB)	Off-Chip Memory Expansion (EMI)	Peripherals	Packaging	Additional Information
MC56F8122VFA MC56F8122VFAE	40 MHz 40 MIPS	40/8	n/a	2 SPI, 2 SCI, 2 ADC, COP, PLL, Quad Timer	48-pin LQFP 48-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, and up to 21 GPIOs.
MC56F8123VFB MC56F8123VFBE	40 MHz 40 MIPS	40/8	n/a	2 SPI, 2 SCI, 2 ADC, COP, PLL, Quad Timer	64-pin LQFP 64-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, on-chip relaxation oscillator, and up to 27 GPIOs.
MC56F8135VFGE	40 MHz 40 MIPS	72/8	n/a	2 SPI, 2SCI, 4 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers	128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, and up to 49 GPIOs.
MC56F8145VFG MC56F8145VFGE	40 MHz 40 MIPS	136/8	n/a	2 SPI, 2 SCI, 4 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers	128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 49 GPIOs.
MC56F8146VFB MC56F8146VFBE	40 MHz 40 MIPS	136/8	Yes	2 SPI, 2 SCI, 4 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers	144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 62 GPIOs.
MC56F8147VPY (LQFP) MC56F8147VPYE (LQFP) MC56F8147VFE (MAPBGA)	40 MHz 40 MIPS	136/8	Yes	2 SPI, 2 SCI, 4 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers	160-pin LQFP 160-pin LQFP* 160-ball MAPBGA*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 76 GPIOs.
MC56F8155VFG MC56F8155VFGE	40 MHz 40 MIPS	272/16	n/a	2 SPI, 2 SCI, 4 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers	128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 49 GPIOs.
MC56F8156VFB MC56F8156VFBE	40 MHz 40 MIPS	272/16	Yes	2 SPI, 2 SCI, 4 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers	144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 62 GPIOs.

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56800E FAMILY (continued)

56F8100 Series General Purpose 16-Bit Fixed Point ^{Note} (continued)

Product	Performance	Flash/RAM (KB)	Off-Chip Memory Expansion (EMI)	Peripherals	Packaging	Additional Information
MC56F8157VPY (LQFP) MC56F8157VPYE (LQFP) MC56F8157VVE (MAPBGA)	40 MHz 40 MIPS	272/16	Yes	2 SPI, 2 SCI, 4 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers	160-pin LQFP 160-pin LQFP* 160-ball MAPBGA*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 76 GPIOs.
MC56F8165VFG MC56F8165VFG E	40 MHz 40 MIPS	544/32	n/a	2 SPI, 2 SCI, 4 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers	128-pin LQFP 128-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 49 GPIOs.
MC56F8166VVF MC56F8166VVE	40 MHz 40 MIPS	544/32	Yes	2 SPI, 2 SCI, 4 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers	144-pin LQFP 144-pin LQFP*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 62 GPIOs.
MC56F8167VPY (LQFP) MC56F8167VPYE (LQFP) MC56F8167VVE (MAPBGA)	40 MHz 40 MIPS	544/32	Yes	2 SPI, 2 SCI, 4 ADC, PWM, COP, PLL, Decoder, 2 Quad Timers	160-pin LQFP 160-pin LQFP* 160-ball MAPBGA*	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug and up to 76 GPIOs.

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Applications	Development Tools	Benefits
Motion Control <ul style="list-style-type: none"> Smart appliances Environmental controls Instrumentation 	Refer to <i>Development Tools</i> beginning on page 15.	Precise programming of drive waveforms allows control over power consumption, reducing noise and other forms of energy usage. Provides either vector or vectorless control depending on application need and motor type; controller type can be selected to match exact design requirements. Distortion correction to assure waveform purity.
Industrial <ul style="list-style-type: none"> Uninterruptable power supplies Noise cancellation/suppression Temperature control HVAC Inverters and AC-to-DC conversion Lighting Automation 	Refer to <i>Development Tools</i> beginning on page 15.	Provides specific I/O and memory tailored to the design need. Capabilities range from lowest cost part for sensorless speed-control algorithms to parts having extended memory and I/O suitable for high-end systems. Has extended PWM and ADC modules, as well as low-cost Boot Flash, for all types of motor-control, conversion, and automation requirements. High number of MIPS allows control of each axis in multi-axis systems.
Instrumentation <ul style="list-style-type: none"> Medical Scientific Servo controllers 	Refer to <i>Development Tools</i> beginning on page 15.	Excellent choice for position control in applications using AC induction and synchronous PM motors. These controllers can be used for low-end position control, vector control, and sensorless vector control. Extended CAN (Controller Area Network) for advanced applications. High MIPS for performance control of multi-axis systems. Allows for multiple fault inputs. High waveform purity is achieved by constant distortion correction.

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56F8000 Series General Purpose 16-Bit Fixed Point ^{Note}

Product	Performance	Boot ROM/Program RAM, Data RAM	Off-Chip Memory Expansion (EMI)	Peripherals	Packaging	Additional Information
MC56F8013VFAE	32 MHz 32 MIPS	16K/4K	—	6 Channel PWM, Quad Timer, SPI, SCI with LIN slave, PLL, dual 3 Channel 12-bit ADCs, COP, POR, I ² C, On-Chip oscillator	32-pin LQFP	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 26 GPIOs.
MC56F8014VFAE	32 MHz 32 MIPS	16K/4K	—	5 Channel PWM, Quad Timer, SPI, SCI with LIN slave, PLL, dual 4 Channel 12-bit ADCs, COP, POR, I ² C, On-Chip oscillator	32-pin LQFP	Industrial (-40°C to 105°C), MCU-friendly instruction set, Enhanced OnCE for debug, temperature sensor, and up to 26 GPIOs.
Applications	Development Tools			Benefits		
<ul style="list-style-type: none"> Smart sensors Industrial motor control Dimming lamp ballast Switched-mode power supply Coft-switching PFC AC-DC power supplies 	Refer to <i>Software and Development Tools</i> beginning on page 15.			Because of its low cost, configuration flexibility, and compact program code, the 56F8013 is well suited for many applications. The 56800E core is based on a Harvard architecture consisting of three execution units operating in parallel, allowing as many as six operations per instruction cycle. The microprocessor-style programming model and optimized instruction set allow straightforward generation of efficient, compact code for both DSP and MCU applications.		

Note: Contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for product availability.

56800E FAMILY (continued)

56850 Series General Purpose 16-Bit Fixed Point ^{Note}

Product	Performance	Boot ROM/ Program RAM Data RAM	Off-Chip Memory Expansion (EMI)	Peripherals	Packaging	Additional Information
DSP56852VF120 DSP56852VFE	120 MHz 120 MIPS	1K/6K/4K (words)	Up to 2M program and 6M of data	SCI, SPI, ISSI, EMI, COP, Quad Timer	81-ball MAPBGA 81-ball MAPBGA*	MCU-friendly instruction set, Enhanced OnCE for debug, up to four programmable chip select signals, and up to 11 GPIO.
DSP56854FG120 DSP56854FGE	120 MHz 120 MIPS	1K/12K/4K (words)	Up to 2M program and 8M of data	2 SCI, SPI, ESSI, HI, EMI, COP, DMA, TOD, Quad Timer	128-pin LQFP 128-pin LQFP*	MCU-friendly instruction set, Enhanced OnCE for debug, six channels of DMA, up to four programmable chip select signals, and up to 41 GPIO.
DSP56854FG120 DSP56854FGE	120 MHz 120 MIPS	1K/16K/16K (words)	Up to 2M program and 8M of data	2 SCI, SPI, ESSI, HI, EMI, COP, DMA, TOD, Quad Timer	128-pin LQFP 128-pin LQFP*	MCU-friendly instruction set, Enhanced OnCE for debug, six channels of DMA, up to four programmable chip select signals, and up to 41 GPIO.
DSP56855BU120 DSP56855BUE	120 MHz 120 MIPS	1K/24K/24K (words)	Up to 2M program and 8M of data	2 SCI, ESSI, EMI, COP, DMA, TOD, Quad Timer	100-pin LQFP 100-pin LQFP*	MCU-friendly instruction set, Enhanced OnCE for debug, six channels of DMA, on-chip relaxation oscillator, up to four programmable chip select signals, and up to 18 GPIO.
DSP56857BU120 DSP56857BUE	120 MHz 120 MIPS	1K/40K/24K (words)	n/a	2 SCI, SPI, 2 ESSI, HI, COP, DMA, TOD, Quad Timer	100-pin LQFP 100-pin LQFP*	MCU-friendly instruction set, Enhanced OnCE for debug, six channels of DMA, and up to 47 GPIO.
DSP56858FV120 (LQFP) DSP56858FVE (LQFP) DSP56858VF120 (MAPBGA)	120 MHz 120 MIPS	1K/40K/24K (words)	Up to 2M program and 8M of data	2 SCI, SPI, 2 ESSI, HI, EMI, COP, DMA, TOD, Quad Timer	144-pin LQFP 144-pin LQFP* 144-ball MAPBGA	MCU-friendly instruction set, Enhanced OnCE for debug, six channels of DMA, up to four programmable chip select signals, and up to 47 GPIO.
Applications			Development Tools		Benefits	
Telephony <ul style="list-style-type: none"> • Telco interface • Codecs • LCD and Keypad support 			Refer to <i>Software and Development Tools</i> beginning on page 15.		Provides seamless connection to codecs from SSI or ESSI peripherals. SPI allows connection to Flash card devices and real-time clock display.	
Client-side IP phone <ul style="list-style-type: none"> • Voice-band codec • Keypad • Optional LCD • Connection: <ul style="list-style-type: none"> - Ethernet or USB to LAN - DAA to Telco - RF to wireless LAN 			Refer to <i>Software and Development Tools</i> beginning on page 15.		With MCU functionality and DSP processing power combined with a large number of peripherals and I/O, the 800E parts offer a single chip solution for client-side IP phones.	
Internet Audio <ul style="list-style-type: none"> • Internet Audio decoding • Internet Audio stand-alone player 			Refer to <i>Software and Development Tools</i> beginning on page 15.		Provides sufficient peripherals and I/O to connect with minimal or glueless logic to internet audio. These programmable DSP devices also offer the ability to support future audio formats.	
Voice Processing <ul style="list-style-type: none"> • Multichannel VoIP • Voice Recognition 			Refer to <i>Software and Development Tools</i> beginning on page 15.		The 800E family of products offer additional channels and/or extra signal processing for VoIP applications using other Freescale Semiconductor processors. The PowerPC and ColdFire System Interface Units (SIUs) connect directly to the 5685x Host Interface peripheral. For each available chip select on the PPPC or ColdFire, an additional 5685x device can be added without glue logic.	

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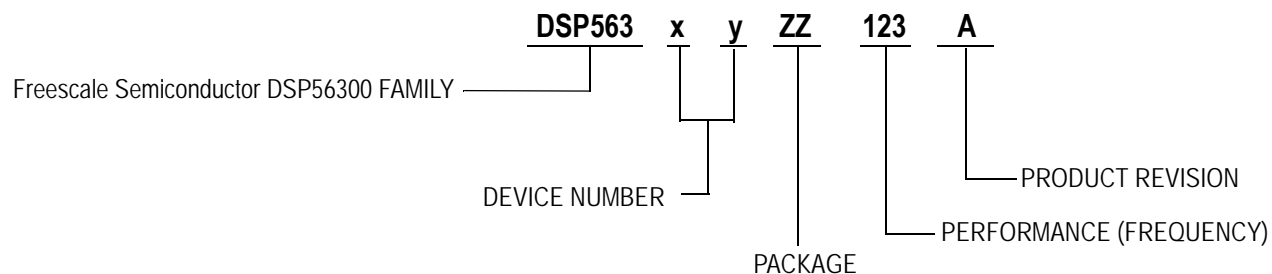
*This package is RoHS compliant.

DSP56300 FAMILY

DSP56300 Family High Performance 24-Bit Fixed Point

Product	MOQ	Packaging	Performance	Sample Part Number (2-Unit Sample Pack)	Voltage Core, I/O	Internal Memory	Peripherals	Applications
DSP56311VF150 DSP56311VL150	126	196-ball MAPBGA (Lead Free Package)	150 MHz 300 MMACS 150 MHz EFCOP	SPAKDSP311VF150 SPAKDSP311VL150	1.8, 3.3 V	384K-bytes 93 to 288K-byte program 96 to 288K-byte data 0 to 3K-byte Instruction Cache	8-bit Host Interface, Two ESSI, SCI, Triple Timer	Networking applications requiring low-cost, high-performance digital signal processing such as voice/data/fax processing, video conferencing, audio applications and control.
DSP56321VF200 DSP56321VL200	126	196-ball MAPBGA (Lead Free Package)	200 MHz 400 MMACS 200 MHz EFCOP	SPAKDSP321VF240 SPAKDSP321VL240	1.6, 3.3 V	576K-bytes 96 to 336K-byte program 480 to 240K-byte data 0 to 3K-byte Instruction Cache		
DSP56321VF220 DSP56321VL220	126	196-ball MAPBGA (Lead Free Package)	220 MHz 440 MMACS 220 MHz EFCOP	SPAKDSP321VF240 SPAKDSP321VL240	1.6, 3.3 V			
DSP56321VF240 DSP56321VL240	126	196-ball MAPBGA (Lead Free Package)	240 MHz 480 MMACS 240 MHz EFCOP	SPAKDSP321VF240 SPAKDSP321VL240	1.6, 3.3 V			
DSP56321VF275 DSP56321VL275	126	196-ball MAPBGA (Lead Free Package)	275 MHz 550 MMACS 275 MHz EFCOP	SPAKDSP321VF275 SPAKDSP321VL275	1.6, 3.3 V			

DSP56300 Networking DSP Product Numbering



DSP563_{XX} FAMILY — AUDIO

Symphony™ Audio DSP Products

Product	Performance	Program RAM	Data RAM (X memory)	Data RAM (Y memory)	Peripherals	Packaging	Additional Information
DSPB56362AG120	120 MHz/120 MIPS	2K - 5K ^{1,2} (words)	5.5K (words)	3.5K - 5.5K ² (words)	ESAI, SHI, DAX, GPIO, HDIO8, Triple Timer Module, Off-Chip Memory Expansion	144-pin LQFP	OnCE; 3.3 V Core; 3.3 V I/O; T _A = 0°C to 70°C
DSPB56364AF100	100 MHz/100 MIPS	0.5K - 1.25K ² (words)	1K (words)	0.75K - 1.5K ² (words)	ESAI, SHI, GPIO, Byte wide Off-Chip Memory Expansion	100-pin LQFP	OnCE; 3.3 V Core; 3.3 V I/O; T _A = 0°C to 70°C
DSPB56366AG120	120 MHz/120 MIPS	2K - 10K ^{1,2} (words)	8K-13K ² (words)	5K - 7K ² (words)	Two ESAI, SHI, DAX, GPIO, HDIO8, Triple Timer Module, Off-Chip Memory Expansion	144-pin LQFP	OnCE; 3.3 V Core; 3.3 V I/O; T _A = 0°C to 70°C
DSPB56367AG150	150 MHz/150 MIPS	3K (words)	8K-13K ² (words)	5K - 7K ² (words)	Two ESAI, SHI, DAX, GPIO, HDIO8, Triple Timer Module; Off-Chip Memory Expansion	144-pin LQFP	OnCE; 1.8 V Core; 3.3 V I/O; T _A = 0°C to 70°C; Off-Chip Memory Expansion
DSPD56367AG150 ³	150 MHz/150 MIPS	3K (words)	8K-13K ² (words)	5K - 7K ² (words)	Two ESAI, SHI, DAX, GPIO, HDIO8, Triple Timer Module	144-pin LQFP	OnCE; 1.8 V Core; 3.3 V I/O; T _A = 0°C to 70°C; Off-Chip Memory Expansion
DSPB56371AF150	150 MHz/150 MIPS	4K - 44K ¹ (words)	28K-36K ¹ (words)	16K - 48K ² (words)	Two ESAI, SHI, DAX, GPIO, HDIO8, Triple Timer Module, EFCOP	80-pin LQFP	OnCE; 1.25 V Core; 3.3 V I/O; T _A = 0°C to 70°C
DSPB56371AF180	180 MHz/180 MIPS	4K - 44K ¹ (words)	28K-36K ¹ (words)	16K - 48K ² (words)	Two ESAI, SHI, DAX, GPIO, HDIO8, Triple Timer Module, EFCOP	80-pin LQFP	OnCE; 1.25 V Core; 3.3 V I/O; T _A = 0°C to 70°C
DSPC56371AF150 ³	150 MHz/150 MIPS	4K - 44K ¹ (words)	28K-36K ¹ (words)	16K - 48K ² (words)	Two ESAI, SHI, DAX, GPIO, HDIO8, Triple Timer Module, EFCOP	80-pin LQFP	OnCE; WMA, PLIIx; NEO:6, DTS2.3 AAC Dolby Headphone/Dolby Virtual Speaker; 1.25 V Core; 3.3 V I/O; T _A = 0°C to 70°C
DSPC56371AF180 ³	180 MHz/180 MIPS	4K - 44K ¹ (words)	28K-36K ¹ (words)	16K - 48K ² (words)	Two ESAI, SHI, DAX, GPIO, HDIO8, Triple Timer Module, EFCOP	80-pin LQFP	OnCE; WMA, PLIIx; NEO:6, DTS2.3 AAC Dolby Headphone/Dolby Virtual Speaker; 1.25 V Core; 3.3 V I/O; T _A = 0°C to 70°C
DSPD56371AF180 ³	180 MHz/180 MIPS	4K - 44K ¹ (words)	28K-36K ¹ (words)	16K - 48K ² (words)	Two ESAI, SHI, DAX, GPIO, HDIO8, Triple Timer Module, EFCOP	80-pin LQFP	OnCE; DD/DTS 5.1 decoding + Dolby Headphone & Dolby Virtual Speaker 1.25 V Core; 3.3 V I/O; T _A = 0°C to 70°C
DSPB56374AE	150 MHz/150 MIPS	2K - 10K ¹ (words)	4K-10K ¹ (words)	4K - 6K ² (words)	One ESAI, SHI, GPIO, Triple Timer Module, Watch Dog Timer	52-pin LQFP	OnCE; 1.25 V Core; 3.3 V I/O; T _A = 0°C to 70°C
DSPB56374AF	150 MHz/150 MIPS	2K - 10K ² (words)	4K-10K ¹ (words)	4K - 6K ² (words)	Two ESAI, SHI, GPIO, Triple Timer Module, Watch Dog Timer	80-pin LQFP	OnCE; 1.25 V Core; 3.3 V I/O; T _A = 0°C to 70°C
DSPB56374AEC	150 MHz/150 MIPS	2K - 10K ¹ (words)	4K-10K ¹ (words)	4K - 6K ² (words)	One ESAI, SHI, GPIO, Triple Timer Module, Watch Dog Timer	52-pin LQFP	OnCE; 1.25 V Core; 3.3 V I/O; T _A = -40°C to 85°C; Auto
DSPB56374AFC	150 MHz/150 MIPS	2K - 10K ² (words)	4K-10K ¹ (words)	4K - 6K ² (words)	One ESAI, SHI, GPIO, Triple Timer Module, Watch Dog Timer	80-pin LQFP	OnCE; 1.25 V Core; 3.3 V I/O; T _A = -40°C to 85°C; Auto
DSPD56374AE ³	150 MHz/150 MIPS	2K - 10K ² (words)	4K-10K ² (words)	4K - 6K ³ (words)	One ESAI, SHI, GPIO, Triple Timer Module, Watch Dog Timer	52-pin LQFP	OnCE; 1.25 V Core; 3.3 V I/O; T _A = 0°C to 70°C; PLII, Dolby Digital, Dolby Headphone and Dolby Virtual Speaker
DSPD56374AEC	150 MHz/150 MIPS	2K - 10K ² (words)	4K-10K ² (words)	4K - 6K ³ (words)	One ESAI, SHI, GPIO, Triple Timer Module, Watch Dog Timer	52-pin LQFP	OnCE; 1.25 V Core; 3.3 V I/O; T _A = -40°C to 85°C; Auto; PLII, Dolby Digital, Dolby Headphone and Dolby Virtual Speaker
DSPA56720AG ³	200 MHz per core/400 MIPS	8K - 36K ² per core (words)	32K/36K ² per core (words)	24K - 48K ² per core (words)	4 ESAI, S/PDIF, ASRC, 2 SHI, 2 Triple Timer Modules, External Memory Controller, GPIO, Inter-Core Communication	144-pin LQFP	OnCE, 1.0 V, T _A = 0°C to 70°C, Dolby Digital+, Dolby TrueHD, DTS-HD and Legacy Dolby/DTS 5.1 Decoders and Post Processing
DSPB56720AG	200 MHz per core/400 MIPS	8K - 36K ² per core (words)	32K/36K ² per core (words)	24K - 48K ² per core (words)	4 ESAI, S/PDIF, ASRC, 2 SHI, 2 Triple Timer Modules, External Memory Controller, GPIO, Inter-Core Communication	144-pin LQFP	OnCE, 1.0 V, T _A = 0°C to 70°C

1. Including 1K of selectable cache.

2. Various memory switches available for re-allocating PRAM, XRAM and YRAM.

3. Where applicable, Dolby and DTS licenses are required prior to product purchase.

DSP563_{xx} FAMILY — AUDIO (continued)

Symphony™ Audio DSP Products (continued)

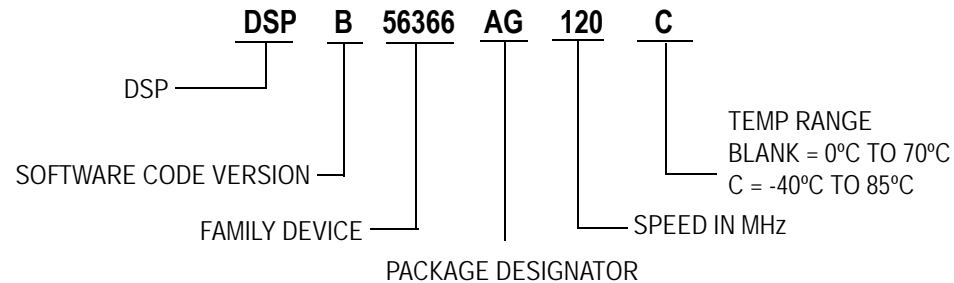
Product	Performance	Program RAM	Data RAM (X memory)	Data RAM (Y memory)	Peripherals	Packaging	Additional Information
DSPA56721AG ³	200 MHz per core/400 MIPS	8K - 36K ² per core (words)	32K/36K ² per core (words)	24K - 48K ² per core (words)	4 ESAI, S/PDIF, ASRC, 2 SHI, 2 Triple Timer Modules, GPIO, Inter-Core Communication, Parallel Host Interface	144-pin LQFP	OnCE, 1.0 V, T _A = 0°C to 70°C, Dolby Digital+, Dolby TrueHD, DTS-HD and Legacy Dolby/DTS 5.1 Decoders and Post Processing
DSPB56721AG	200 MHz per core/400 MIPS	8K - 36K ² per core (words)	32K/36K ² per core (words)	24K - 48K ² per core (words)	4 ESAI, S/PDIF, ASRC, 2 SHI, 2 Triple Timer Modules, GPIO, Inter-Core Communication	144-pin LQFP	OnCE, 1.0 V, T _A = 0°C to 70°C
DSPA56721AF ³	200 MHz per core/400 MIPS	8K - 36K ² per core (words)	32K/36K ² per core (words)	24K - 48K ² per core (words)	4 ESAI, S/PDIF, ASRC, 2 SHI, 2 Triple Timer Modules, GPIO, Inter-Core Communication	80-pin LQFP	OnCE, 1.0 V, T _A = 0°C to 70°C, Dolby Digital+, Dolby TrueHD, DTS-HD
DSPB56721AF	200 MHz per core/400 MIPS	8K - 36K ² per core (words)	32K/36K ² per core (words)	24K - 48K ² per core (words)	4 ESAI, S/PDIF, ASRC, 2 SHI, 2 Triple Timer Modules, GPIO, Inter-Core Communication	80-pin LQFP	OnCE, 1.0 V, T _A = 0°C to 70°C
DSPB56724AG	250 MHz per core / 500 MIPS	Core0: 4K-40K ² (words) Core1: 2K-16K ² (words)	Core0: 8K-28K ² (words) Core1: 4K-12K ² (words)	Core0: 8K-24K ² (words) Core1: 4K-10K ² (words)	4 ESAI, S/PDIF, ASRC, 2 SHI, 2 Triple Timer Modules, GPIO, Inter-Core Communication, External Memory Controller	144-pin LQFP	OnCE, 1.2V, T _A = 0°C to 70°C
DSPB56725AF	250 MHz per core / 500 MIPS	Core0: 4K-40K ² (words) Core1: 2K-16K ² (words)	Core0: 8K-28K ² (words) Core1: 4K-12K ² (words)	Core0: 8K-24K ² (words) Core1: 4K-10K ² (words)	4 ESAI, S/PDIF, ASRC, 2 SHI, 2 Triple Timer Modules, GPIO, Inter-Core Communication	80-pin LQFP	OnCE, 1.2V, T _A = 0°C to 70°C

1. Including 1K of selectable cache.

2. Various memory switches available for re-allocating PRAM, XRAM and YRAM.

3. Where applicable, Dolby and DTS licenses are required prior to product purchase.

DSP563_{xx} DSP Product Numbering



MSC7100 FAMILY

Based on StarCore® Architecture

Product	MOQ	Packaging	Performance	Sample Part Number (2-Unit Sample Pack)	Voltage Core, Memory, I/O (V)	Internal Memory	Peripherals	Applications
MSC7119VM1200	90	400-ball MAPBGA Lead-Free	1200 MMACS @ 300 MHz, DDR300	KMSC7119VM1200	1.2, 2.5, 3.3	472 KB Total RAM (16 KB ICache, 8 KB Boot ROM, 256 KB M1 192 KB M2)	HDI16 Host Port, DDR Controller, 2 TDM (128-ch/port), 10/100 Ethernet MAC, UART, I ² C	High-density VoIP Enterprise/ROBO Wireless comm., Security Systems, Instrumentation, Industrial Control, Automation, General Purpose.
MSC7119VF1200	90	400-ball MAPBGA Lead-Bearing	1200 MMACS @ 300 MHz, DDR300	KMSC7119VF1200	1.2, 2.5, 3.3	472 KB Total RAM (16 KB ICache, 8 KB Boot ROM, 256 KB M1 192 KB M2)	HDI16 Host Port, DDR Controller, 2 TDM (128-ch/port), 10/100 Ethernet MAC, UART, I ² C	High-density VoIP Enterprise/ROBO Wireless comm., Security Systems, Instrumentation, Industrial Control, Automation, General Purpose.
MSC7118VM1200	90	400-ball MAPBGA Lead-Free	1200 MMACS @ 300 MHz, DDR300	KMSC7118VM1200	1.2, 2.5, 3.3	472 KB Total RAM (16 KB ICache, 8 KB Boot ROM, 256 KB M1 192 KB M2)	HDI16 Host Port, DDR Controller, 3 TDM (128-ch/port), UART, I ² C	High-density VoIP Enterprise/ROBO Wireless comm., Security Systems, Instrumentation, Industrial Control, Automation, General Purpose Applications that require Ethernet.
MSC7118VF1200	90	400-ball MAPBGA Lead-Bearing	1200 MMACS @ 300 MHz, DDR300	KMSC7118VF1200	1.2, 2.5, 3.3	472 KB Total RAM (16 KB ICache, 8 KB Boot ROM, 256 KB M1 192 KB M2)	HDI16 Host Port, DDR Controller, 3 TDM (128-ch/port), UART, I ² C	High-density VoIP Enterprise/ROBO Wireless comm., Security Systems, Instrumentation, Industrial Control, Automation, General Purpose Applications that require Ethernet.
MSC7116VM1000	90	400-ball MAPBGA Lead-Free	1000 MMACS @ 266 MHz, DDR266	KMSC7116VM1000	1.2, 2.5, 3.3	408 KB Total RAM (16 KB ICache, 8 KB Boot ROM, 192 KB M1 192 KB M2)	HDI16 Host Port, DDR Controller, 2 TDM (128-ch/port), 10/100 Ethernet MAC, UART, I ² C	High-density VoIP Enterprise/ROBO Wireless comm., Security Systems, Instrumentation, Industrial Control, Automation, General Purpose Applications that require Ethernet.
MSC7116VF1000	90	400-ball MAPBGA Lead-Bearing	1000 MMACS @ 266 MHz, DDR266	KMSC7116VF1000	1.2, 2.5, 3.3	408 KB Total RAM (16 KB ICache, 8 KB Boot ROM, 192 KB M1 192 KB M2)	HDI16 Host Port, DDR Controller, 2 TDM (128-ch/port), 10/100 Ethernet MAC, UART, I ² C	High-density VoIP Enterprise/ROBO Wireless comm., Security Systems, Instrumentation, Industrial Control, Automation, General Purpose Applications that require Ethernet.

MSC7100 GPON FAMILY

Based on StarCore® Architecture and the e300 Power Architecture™

Product	MOQ	Packaging	Performance	Sample Part Number (2-Unit Sample Pack)	Voltage Core, I/O (V)	Internal Memory	Peripherals	Applications
MSC7120	24	456-ball TEPBGAII	DSP: 178 MHz 712 MMACS e300: 266 MHz 511 Dhrystone 2.1 MIPS 66 MHz System Bus	—	1.0, 1.8/2.5	e300: 16 KB L1 ICache 16 KB L1 DCache DSP: 16 KB L1 ICache 128 KB M1 8 KB M2	DSP core, e300 core, dedicated packet forwarding engine, DDR memory controller (266 MHz data rate), two 10/100/1000 Ethernet controllers with MGMI,II, RGMII, MII, and FIFO8 interfaces, Gigabit passive optical network media access controller, optical module interface local bus controller, DUART, I ² C, SPI, TDM, JTAG, and up to 48 GPIOs.	Broadband passive optical network termination applications.

MSC8100 FAMILY

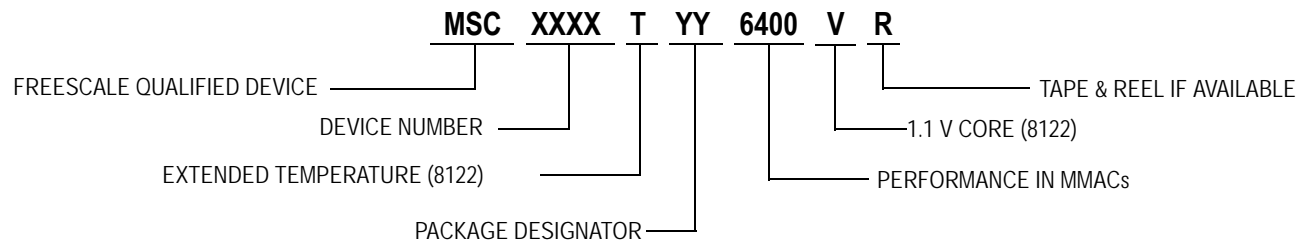
Based on StarCore® Architecture

Product	MOQ	Packaging	Performance	Sample Part Number (2-Unit Sample Pack)	Voltage Core, I/O (V)	Internal Memory	Peripherals	Applications
MSC8112TVT2400V MSC8112TMP2400V	60	431-ball PBGA (Lead-Free Package) (Lead-bearing Package)	300 MHz 2400 MMACS 100 MHz System Bus	KMSC8112TVT2200 KMSC8112TMP2400	1.1, 3.3	1.436 MB unified program and data memory	2 cores, 8 ALUs, System Integration Unit, 32-channel DMA, 32/64-bit system bus, 32/64-bit Direct Slave Interface, 1024 channel TDM Interface, UART, 32 timers, hardware semaphores, 32 GPIOs, I ² C interface for boot from Serial-EEPROM, Ethernet support for MII, RMI, and SMII.	The MSC8112 is targeted specifically at packet telephony media gateways, multichannel modem banks and third-generation wireless systems, as well as video security servers, video surveillance systems, image processing, and military applications.
MSC8113TVT3600V MSC8113TMP3600V	60	431-ball PBGA (Lead-Free Package) (Lead-bearing Package)	300 MHz, 100 MHz System Bus	KMSC8113TVT3600 KMSC8113TMP3600	1.1, 3.3		3 cores, 12 ALUs, System Integration Unit, 32-channel DMA, 32/64-bit system bus, 32/64-bit Direct Slave Interface, 1024 channel TDM Interface, UART, 32 timers, hardware semaphores, 32 GPIOs, I ² C interface for boot from Serial-EEPROM, Ethernet support for MII, RMI, and SMII.	The MSC8113 is targeted specifically at packet telephony media gateways, multichannel modem banks and third-generation wireless systems, as well as video security servers, video surveillance systems, image processing, and military applications.
MSC8113TVT4800V MSC8113TMP4800V	60	431-ball PBGA (Lead-Free Package) (Lead-bearing Package)	400 MHz, 4800 MMACS 133.3 MHz System Bus	KMSC8113TVT4800 KMSC8113TMP4800	1.1, 3.3		4 cores, 16 ALUs, System Integration Unit, 32-channel DMA, 32/64-bit system bus, 32/64-bit Direct Slave Interface, 1024 channel TDM Interface, UART, 32 timers, hardware semaphores, 32 GPIOs, I ² C interface for boot from Serial-EEPROM, Ethernet support for MII, RMI, and SMII.	The MSC8122 is targeted specifically at packet telephony media gateways, multichannel modem banks and third-generation wireless systems, as well as video security servers, video surveillance systems, image processing, and military applications.
MSC8122TVT4800V MSC8122TMP4800V	60	431-ball PBGA (Lead-Free Package) (Lead-bearing Package)	300 MHz 4800 MMACS 100 MHz System Bus	KMSC8122TVT4800 KMSC8122TMP4800	1.1, 3.3		4 cores, 16 ALUs, System Integration Unit, 32-channel DMA, 32/64-bit system bus, 32/64-bit Direct Slave Interface, 1024 channel TDM Interface, UART, 32 timers, hardware semaphores, 32 GPIOs, I ² C interface for boot from Serial-EEPROM, Ethernet support for MII, RMI, and SMII.	The MSC8122 is targeted specifically at packet telephony media gateways, multichannel modem banks and third-generation wireless systems, as well as video security servers, video surveillance systems, image processing, and military applications.
MSC8122TVT6400V MSC8122TMP6400V	60	431-ball PBGA (Lead-Free Package) (Lead-bearing Package)	400 MHz, 6400 MMACS 133.3 MHz System Bus	KMSC8122TVT6400V KMSC8122TMP6400V	1.1, 3.3			
MSC8122TVT6400 MSC8122TMP6400	60	431-ball PBGA (Lead-Free Package) (Lead-bearing Package)	400 MHz, 6400 MMACS 133.3 MHz System Bus	KMSC8122TVT6400 KMSC8122TMP6400	1.2, 3.3		4 cores, 16 ALUs, System Integration Unit, 32-channel DMA, 32/64-bit system bus, 32/64-bit Direct Slave Interface, 1024 channel TDM interface, UART, 32 timers, hardware semaphores, 32 GPIOs, I ² C interface for boot from Serial-EEPROM, Ethernet support for MII, RMI, and SMII, Viterbi Coprocessor, Turbo Coprocessor.	The MSC8126 is targeted specifically towards 3G wireless basestations. In addition to baseband applications, applications include video security servers, video surveillance systems, image processing, military and packet telephony.
MSC8122VT8000 ¹ MSC8122MP8000 ¹	60	431-ball PBGA (Lead-Free Package) (Lead-bearing Package)	500 MHz 8000 MMACS 166.6 MHz System Bus	KMSC8122VT8000 KMSC8122MP8000	1.2, 3.3			
MSC8126TVT6400 MSC8126TMP6400	60	431-ball PBGA (Lead-Free Package) (Lead-bearing Package)	400 MHz 6400 MMACS TCOP, VCOP 133.3 MHz System Bus	KMSC8126TVT6400 KMSC8126TMP6400	1.2, 3.3			
MSC8126VT8000 MSC8126MP8000	60	431-ball PBGA (Lead-Free Package) (Lead-bearing Package)	500 MHz 8000 MMACS TCOP, VCOP 166.6 MHz System Bus	KMSC8126VT8000 KMSC8126MP8000	1.2, 3.3			
MSC8144SVT800A MSC8144VT800A	60	783-ball FC PBGA (Lead-Free Package)	800 MHz 12800 MMACS	KMSC8144SVT800A KMSC8144VT800A	1, 1.8, 2.5, 3.3		10.96 MB	4 SC3400 DSP core subsystems, CLASS non-blocking interconnect fabric, DDR controller (400 MHz data rate), 32-channel DMA controller, 8 TDMs (2048 send and 2048 receive channels), dual-RISC QUICC Engine™ subsystem with 2 Gbit Ethernet controllers/ 1 ATM controller/SPI, PCI, serial RapidIO® subsystem with dedicated 4-channel DMA controller, UART, 8 16-bit timers, I ² C, 8 hardware semaphores, GPIOs/external hardware interrupts, and virtual interrupt system.
MSC8144SVT1000A MSC8144VT1000A	60	783-ball FC PBGA (Lead-Free Package)	1000 MHz 16000 MMACS	KMSC8144SVT1000A KMSC8144VT1000A	1, 1.8, 2.5, 3.3	10.96 MB	4 SC3400 DSP core subsystems, CLASS non-blocking interconnect fabric, DDR controller (400 MHz data rate), 32-channel DMA controller, 8 TDMs (2048 send and 2048 receive channels), dual-RISC QUICC Engine™ subsystem with 2 Gbit Ethernet controllers/ 1 ATM controller/SPI, PCI, serial RapidIO® subsystem with dedicated 4-channel DMA controller, UART, 8 16-bit timers, I ² C, 8 hardware semaphores, GPIOs/external hardware interrupts, and virtual interrupt system, security block for data encryption/decryption during processing.	
MSC8144ESVT800A MSC8144EVT800A	—	783-ball FC PBGA (Lead-Free Package)	800 MHz 12800 MMACS	—	1, 1.8, 2.5, 3.3	10.96 MB		
MSC8144ESVT1000A MSC8144EVT1000A	—	783-ball FC PBGA (Lead-Free Package)	1000 MHz 16000 MMACS	—	1, 1.8, 2.5, 3.3	10.96 MB		

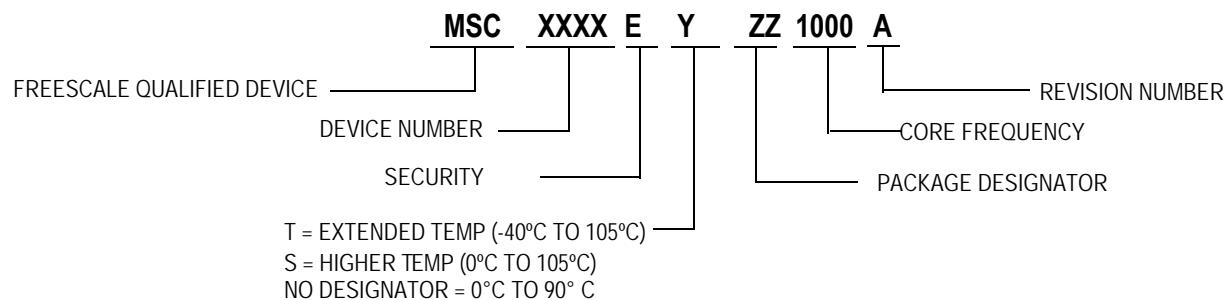
1. Not available in extended temperatures. (-40°C to +105°C)

MSC8100 FAMILY (continued)

Family Product Numbering for the MSC7000, MSC8122, and MSC8126



Family Product Numbering for the MSC8144



MSBA8100 FAMILY

Multi-Standard Baseband Accelerator for MSC8144

Product	MOQ	Packaging	Performance	Sample Part Number (2-Unit Sample Pack)	Voltage Core, I/O (V)	Internal Memory	Peripherals	Applications
PC8100	—	783-ball FCPBGA	Turbo/Viterbi Decoder up to 115/133 Mbps respectively, Up to 165 Msps FFT and 145 Msps DFT	—	1.0, 1.8, 2.5, 3.3	512 KB Shared M2	MAPLE-B Accelerator, 512 Kbyte M2 memory (SRAM), DDR2 SDRAM 333MHz, 32 bit, CLASS – Chip-Level Arbitration & Switching Fabric, Dual 4x/1x Serial RapidIO™ interfaces at 1.25/2.5/3.125 Gbaud, PCI 32b/66MHz, hardware semaphores, 4 GPIOs	The MSBA8100 baseband accelerator together with the existing MSC8144 is designed to bolster the new wireless standards and enable cellular infrastructure manufacturers to create low-cost and differentiated channel cards for next generation standalone or unified 3G-LTE, WiMAX, HSPA, 3GPP2 and TD-SCDMA, TDD-LTE base stations.

DSP56300

24-Bit

Product	Core Performance (16-bit MMACS)	Core Speed (MHz)	# of DSP Cores	I-Cache (per core) (kByte)	D-Cache (per core) (kByte)	Total On-Chip SRAM (kByte)	On-Chip SRAM (kByte x words)	M2 Memory	External Memory Interface	DMA Channels	CPM/QUICC Engine	ESSI	SCI1	GPIO	Timers	Bus Frequency (MHz)	Bus Width (internal) (bit)	Bus Width (external) (bit)	Core Voltage (V)	I/O Voltage (V)	Host Port Interface (bit)	Low Power Modes	Accelerators	Package
DSP56311	300 w/ EFCOP	150	1	—	—	384	128 x 24	—	DRAM, SRAM	6	—	2	1	34	3	150	24	24	1.8	3.3	8	STOP	EFCOP	196-ball MAPBGA
DSP56321	550 w/ EFCOP	200, 220, 240, 275	1	—	—	576	196 x 24	—	SRAM	6	—	2	1	34	3	200, 220, 240, 275	24	24	1.6	3.3	8	STOP	EFCOP	196-ball MAPBGA

STARCORE®

StarCore® Multi-Core

Product	Core Performance (16-bit MMACS)	Core Speed (MHz)	# of DSP Cores	I-Cache (per core) (kByte)	D-Cache (per core) (kByte)	L2-Cache (kByte)	Boot ROM (kByte)	M1 Memory (per core)	Shared M2 Memory	Shared M3 Memory	External Memory Interface	DMA Channels	CPM/QUICC Engine	# of 10/100 BT	Gigabit Ethernet (RGMII, SGMII)	I ² C	UART	UTOPIA L2	PCI	sRIO	SPI	TDM	GPIO	Timers	Ext. Mem Bus Frequency (MHz)	Bus Width (internal) (bit)	Bus Width (external) (bit)	Core Voltage (V)	I/O Voltage (V)	Host Port Interface (bit)	Low Power Modes	Accelerators	Package
MSC8112	2400	300	2	16	—	—	4	224	476	—	SIU/60x-Compatible System Bus	16	—	1	—	yes	yes	—	—	—	—	4	32	32	100	64, 128	32, 64	1.1	3.3	32, 64	STOP, WAIT	—	431 pin FC-PBGA
MSC8113	3600, 4800	300, 400	3	16	—	—	4	224	476	—	SIU/60x-Compatible System Bus	16	—	1	—	yes	yes	—	—	—	—	4	32	32	100, 133	64, 128	32, 64	1.1	3.3	32, 64	STOP, WAIT	—	431 pin FC-PBGA
MSC8122	4800, 6400, 8000	300, 400, 500	4	16	—	—	4	224	476	—	SIU/60x-Compatible System Bus	16	—	1	—	yes	yes	—	—	—	—	4	32	32	100, 133, 166	64, 128	32, 64	1.1, 1.2	3.3	32, 64	STOP, WAIT	—	431 pin FC-PBGA
MSC8126	6400, 8000	400, 500	4	16	—	—	4	224	476	—	SIU/60x-Compatible System Bus	16	—	1	—	yes	yes	—	—	—	—	4	32	32	133, 166	64, 128	32, 64	1.2	3.3	32, 64	STOP, WAIT	TCOP, VCOP	431 pin FC-PBGA
MSC8144	12800, 16000	800, 1000	4	16	32	128	96	—	512	10 MByte	DDR 1 & 2-400MHz	32	Dual RISC cores 400 MHz	2	2	yes	yes	yes	yes	4X/1X	yes	8	32	24	400	64, 128	16, 32	1	1.8/2.5 / 3.3	PCI 2.2	STOP, WAIT	—	783 pin FC-PBGA
MSC8144E	12800, 16000	800, 1000	4	16	32	128	96	—	512	10 MByte	DDR 1 & 2-400MHz	32	Dual RISC cores 400 MHz	2	2	yes	yes	yes	yes	4X/1X	yes	8	32	24	400	64, 128	16, 32	1	1.8/2.5 / 3.3	PCI 2.2	STOP, WAIT	Data Encryption	783 pin FC-PBGA
MSBA8100	—	—	—	—	—	—	—	—	512	—	DDR 1 & 2-333MHz	8	—	—	—	—	—	—	—	yes	4x/1x	—	4	—	333MHz	64	16, 32	1	1.8/2.5/3.3	PCI 2.2	—	Turbo/Viterbi, FFT/IFFT, DFT/IDFT	783 pin FC-PBGA

StarCore® Low Cost

Product	Core Performance (16-bit MMACS)	Core Speed (MHz)	# of DSP Cores	I-Cache (per core) (kByte)	D-Cache (per core) (kByte)	L2-Cache (kByte)	Boot ROM (kByte)	M1 Memory (per core)	Shared M2 Memory	Shared M3 Memory	External Memory Interface	DMA Channels	CPM/QUICC Engine	# of 10/100 BT	Gigabit Ethernet (RGMII, SGMII)	I ² C	UART	UTOPIA L2	PCI	sRIO	SPI	TDM	GPIO	Timers	Ext. Mem Bus Frequency (MHz)	Bus Width (internal) (bit)	Bus Width (external) (bit)	Core Voltage (V)	I/O Voltage (V)	Host Port Interface (bit)	Low Power Modes	Accelerators	Package
MSC7116	800	200	1	16	—	—	8	192	192	—	DDR	32	—	1	—	yes	yes	—	—	—	software	2	46	8	133	128	16, 32	1.2	3.3	8, 16	WAIT, STOP	—	400-ball MAPBGA
MSC7118	1200	300	1	16	—	—	8	256	192	—	DDR	32	—	—	—	yes	yes	—	—	—	software	3	46	8	150	128	16, 32	1.2	3.3	8, 16	WAIT, STOP	—	400-ball MAPBGA
MSC7119	1200	300	1	16	—	—	8	256	192	—	DDR	32	—	1	—	yes	yes	—	—	—	software	2	46	8	150	128	16, 32	1.2	3.3	8, 16	WAIT, STOP	—	400-ball MAPBGA

STARCORE (continued)

StarCore® GPON

Product	Core Performance (16-bit MMACS)	Core Speed (MHz)	# of DSP Cores	I-Cache (per core) (kByte)	D-Cache (per core) (kByte)	L2-Cache (kByte)	Boot ROM (kByte)	M1 Memory (per core)	Shared M2 Memory	Shared M3 Memory	External Memory Interface	DMA Channels	CPM/QUICC Engine	# of 10/100 BT	Gigabit Ethernet (RGMII, SGMII)	I ² C	UART	UTOPIA	PCI	sRIO	SPI	TDM	GPIO	Timers	Ext. Mem Bus Frequency (MHz)	Bus Width (internal) (bit)	Bus Width (external) (bit)	Core Voltage (V)	I/O Voltage (V)	Host Port Interface (bit)	Low Power Modes	Accelerators	Package
MSC7120	712 DSP MMACS 511 Dhrystone 2.1 MIPS	DSP 178 e300 266	1	DSP 16 e300 16	e300 16	—	—	—	—	—	DDR 1 & 2 Local bus controller	—	—	2	2	yes	yes	—	—	—	—	1	48	—	133 (DDR)/66 (Local Bus)	—	32 (DDR) 8/16 (Local Bus)	1.0	1.8/2.5	—	—	Dedicated packet forwarding engine	456-ball TEPBGAII

EVALUATION BOARDS AND DEVELOPMENT KITS

Product	Description	Location
MSC8122ADSE	Application development system for MSC8122	www.freescale.com
MSC8126ADSE	Application development system for MSC8126	www.freescale.com
MSC8144ADS	Application development system for MSC8144	www.freescale.com
MSC8144AMC-S	Advanced mezzanine card for MSC8144	www.freescale.com
MSC711xEVM	Evaluation system for MSC711x family	www.freescale.com
MSC711xADS	Application development system for MSC711x family	www.freescale.com
MSC8144EADS	Application development system for MSC8144E	www.freescale.com
MSBA8100ADS	Application development system for MSBA8100	www.freescale.com

REFERENCE DESIGNS

Product	Description	Location
MSC8144AMC-S	Advanced mezzanine card	www.freescale.com

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DEVELOPMENT TOOLS

56800/56800E/56F8300/56F8100/56F8000 Development Tools — Software

Product	Description	Status
DSPOSRTOS	DSP OS Real-Time Operating System (RTOS)	Available
DSPOSNET	DSP OS Network Software	Available
RTXC	RTXC Real-Time Operating System (RTOS)	Available
RTXCNET	RTXC Networking Protocol Suite	Available
DSP56858SFP	DSP56858 with Feature Phone Application	Available
CWS-568X-SE	CodeWarrior® Development Studio for 56800/E with Processor Expert (limited to 16 KB of program RAM)	Available
CWS-568-C32K-CX	CodeWarrior® Development Studio for 56800/E with Processor Expert (limited to 64 KB of program RAM)	Available
CWS-568-C64K-CX	CodeWarrior® Development Studio for 56800/E with Processor Expert (limited to 128 KB of program RAM)	Available
CWS-568-CX	CodeWarrior® Development Studio for 56800/E with Processor Expert	Available
CWH-UTP-ONCE-HX	CodeWarrior® USB TAP for 56800/E Digital Signal Controllers	Available

56800 Development Tools — Hardware

Product	Description	Status
DSP56800TDC1	Daughter Card for DSP56F826EVM and DSP56F827EVM	Available
DSP56F800DEMO	56F800 Demonstration Kit with US power supply	Available
DSP56F800DEMO-E	56F800 Demonstration Kit with US power supply	Available
DSP56F801EVM	Evaluation kit for the DSP56F801 and DSP56F802 processor (DevTech)	Available
DSP56F803EVM	Evaluation kit for the DSP56F803 processor (DevTech)	Available
DSP56F805EVM	Evaluation kit for the DSP56F805 processor (DevTech)	Available
DSP56F807EVM	Evaluation kit for the DSP56F807 processor (DevTech)	Available
DSP56F826EVM	Evaluation kit for the DSP56F826 processor (DevTech)	Available
DSP56F827EVM	Evaluation kit for the DSP56F827 processor	Available
DSPCOMMANDPCI	Emulation support for DSP56F80X processors. Requires PCI slot (DevTech)	Consult Web or DevTech for availability of CodeWarrior® software support
DSPCOMMETHERNET	Emulation support for DSP56F80X processors. Requires Ethernet network	Consult Web or DevTech for availability of CodeWarrior® software support
DSPCOMMPARALLEL	Emulation support for DSP56F80X processors. Requires parallel port (DevTech)	Available
DSPOSRTOS	DSP OS Real-Time Operating System (RTOS)	Available
ECCTR908MR32	MC68HC908MR32 Control Board	Available
ECINLHIVSR	Three-Phase Switched Reluctance High-Voltage Power Stage	Available
ECLOVACBLDC	Three-Phase BLDC Low-Voltage Power Stage	Available
ECLOVSR	Three-Phase Switched Reluctance Low-Voltage Power Stage	Available
ECMTREVAL	Evaluation Motor Board	Available
ECOPT	Optoisolation Board	Available
ECOPTHIVACBLDC	Three-Phase AC BLDC High-Voltage Power Stage	Available
ECOPTINL	In-Line Optoisolation Box	Available

DEVELOPMENT TOOLS (continued)

56850 Development Tools — Hardware

Product	Description	Status
DSP56852EVM	Evaluation Kit for DSP56852 Processor	Available
DSPCOMMPARALLEL	Parallel Port Command Converter for DSP	Available
DSPCOMMETHERNET	Ethernet Command Converter for DSP	Available
DSPCOMMANDPCI	PCI Command Converter for DSP	Available
DSPCOMMAND	Universal Command Converter for DSP	Available
DSP56858EVM	Evaluation Kit for DSP56858 Embedded Systems	Available
DSP56800TDC1	Daughter Card for DSP56852EVM and DSP56858EVM	Available

56F8000 Development Tools — Hardware

Product	Description	Status
APMOTOR56F8000	56F8000 Motor Control Kit	Available
CPA56F8013	CPA56F8013 Socket Board for 56F8013 Flash Programming	Available
CPA56F8014	CPA56F8014 Socket Board for 56F8014 Flash Programming	Available
DEMO56F8013	Demonstration Board for 56F8013 with US Power Supply	Available
DEMO56F8014	Demonstration Board for 56F8014 with US Power Supply	Available
DEMO56F8013-E	Demonstration Board for 56F8013 with Universal Power Supply	Available
DEMO56F8014-E	Demonstration Board for 56F8014 with Universal Power Supply	Available

56F8300/56F8100 Development Tools — Hardware

Product	Description	Status
MC56F8300DSK	56F8300 Demonstration Kit with US power supply	Available
MC56F8323EVM	Evaluation kit for the 56F8322 and 56F8323 processor (DevTech)	Available
MC56F8367EVM	Evaluation kit for 56F8345-56F8367 processors (DevTech)	Available
DSPCOMMANDPCI	Emulation support for 56F8300 processors. Requires PCI slot (DevTech)	Available
DSPCOMMETHERNET	Emulation support for 56F8300 processors. Requires Ethernet network	Available
DSPCOMMPARALLEL	Emulation support for 56F8300 processors. Requires parallel port (DevTech)	Available
DSPOSRTOS	DSP OS Real-Time Operating System (RTOS)	Available
ECCTR908MR32	MC68HC908MR32 Control Board	Available
ECINLHIVSR	Three-Phase Switched Reluctance High-Voltage Power Stage	Available
ECLOVACBLDC	Three-Phase BLDC Low-Voltage Power Stage	Available
ECLOVSR	Three-Phase Switched Reluctance Low-Voltage Power Stage	Available
ECMTREVAL	Evaluation Motor Board	Available
ECOPT	Optoisolation Board	Available
ECOPTHIVACBLDC	Three-Phase AC BLDC High-Voltage Power Stage	Available
ECOPTINL	In-Line Optoisolation Box	Available

DEVELOPMENT TOOLS (continued)

DSP56300, MSC8100 and MSC7100 Development Tools — Hardware ^{Note}

Product	Description	Status
DSP563xxEVME	DSP563xx Evaluation Module	Available
DSPAUDIOEVMMB1	DSP563xx Evaluation Module (Daughter Cards listed separately)	Available
DSPB362DB1	DSPB362 Evaluation Module Daughter Card	Available
DSPB364DB1	DSPB364 Evaluation Module Daughter Card	Available
DSPB366DB1	DSPB366 Evaluation Module Daughter Card	Available
DSPB367DB1	DSPB367 Evaluation Module Daughter Card	Available
DSPD367DB1	DSPD367 Evaluation Module Daughter Card; Dolby and DTS Licensing Required	Available
DSPA371DB1	DSPA371 Evaluation Module Daughter Card; Dolby and DTS Licensing Required	Available
DSPB371DB1	DSPB371 Evaluation Module Daughter Card	Available
DSPC371DB1	DSPC371 Evaluation Module Daughter Card, Dolby and DTS Licensing Required	Available
DSPD371DB1	DSPD371 Evaluation Module Daughter Card, Dolby and DTS Licensing Required	Available
DSPB374DB1	DSPB374 Evaluation Module Daughter Card	Available
DSPD374DB1	DSPB374 Evaluation Module Daughter Card	Available
DSPCOMMPARALLELE	Command Converter with Parallel Port Host Interface	Available
MSC711xADS	MSC711x Family and MPC8272 Application Development System	Available
MSC711xEVM	Evaluation System for MSC711x Family	Available
MSC8122ADSE	MSC8122 Application Development System Board	Available
MSC8126ADSE	MSC8126 Application Development System Board	Available
MSC8144ADS	MSC8144 Application Development System Board	Available
MSC8144AMC-S	Advanced mezzanine card for MSC8144	Available
MSC8144EADS	MSC8144E Application Development System Board	Available
MSBA8100ADS	MSBA8100 Application Development System Board	Available

Note: www.freescale.com

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DEVELOPMENT TOOLS (continued)

DSP56300, MSC8100 and MSC7100 Development Tools — Software

Tools Description	Partner	Contact
Real-Time Operating System	Quadros Systems, Inc. OSE Systems Express Logic	www.quadros.com www.ose.com www.expresslogic.com
Integrated Development Environment	DevTech	www.freescale.com www.tasking.com
Optimizing Compilers/Assembler/Linker	DevTech	www.freescale.com www.tasking.com
Debugger	DevTech	www.freescale.com www.tasking.com
Simulator	DevTech	www.freescale.com www.tasking.com
DSP Software/Libraries	Global IP Sound Inc	www.globalipsound.com
Hardware Debug Connections/Analyzers	Macraigor Systems DevTech Lauterbach	www.macraigor.com www.freescale.com www.lauterbach.com
Hardware Development Tools	Quantic-EMC	www.quantific-emc.com
Device Driver Software	Freescale Semiconductor SmartDSP OS OSE Systems	www.freescale.com www.ose.com
Training	Arnewsh Inc DSP Systems Inc	http://www.arnewsh.com http://www.dsp-sys.com

MSC7100 AND MSC8100 APPLICATION SOFTWARE

MSC7100, MSC8100 Software Modules

Application/Module	MSC7116	MSC7118	MSC7119	MSC7120	MSC8112	MSC8113	MSC8122	MSC8126	MSC8144	MSC8144E	MSC8144EC
Video Codecs											
H.261									•	•	•
H.263									•	•	•
H.264									•	•	•
MPEG4									•	•	•
Voice Codecs											
G.711	•	•	•	•	•	•	•	•	•	•	•
G.711 App 1 & 2 (PLC & VAD/CNG)	•	•	•	•	•	•	•	•	•	•	•
G.722	•	•	•	•	•	•	•	•	•	•	•
G.723.1	•	•	•	•	•	•	•	•	•	•	•
G.726	•	•	•	•	•	•	•	•	•	•	•
G.726A	•	•	•	•	•	•	•	•	•	•	•
G.728	•	•	•	•	•	•	•	•	•	•	•
G.729B	•	•	•	•	•	•	•	•	•	•	•
G.729AB	•	•	•	•	•	•	•	•	•	•	•
G.729E	•	•	•	•	•	•	•	•	•	•	•
GSM-FR	•	•	•	•	•	•	•	•	•	•	•
GSM-HR	•	•	•	•	•	•	•	•	•	•	•

• = Available

MSC7100 AND MSC8100 APPLICATION SOFTWARE (continued)

MSC7100, MSC8100 Software Modules (continued)

Application/Module	MSC7116	MSC7118	MSC7119	MSC7120	MSC8112	MSC8113	MSC8122	MSC8126	MSC8144	MSC8144E	MSC8144EC
GSM-AMR/EFR	•	•	•	•	•	•	•	•	•	•	•
3GPP-AMR-WB	•	•	•	•	•	•	•	•	•	•	•
IS 127 EVRC-A	•	•	•	•	•	•	•	•	*	*	*
IS 127 EVRC-B	•	•	•	•	•	•	•	•	*	*	*
G722.1C (Siren 14)	•	•	•	•	•	•	•	•	*	*	*
iLBC	•	•	•	•	•	•	•	•	*	*	*
Modems (Pumps)											
- V.23 CallerID	•	•	•	•	•	•	•	•			
- V.34	•	•	•	•	•	•	•	•			
- V.90	•	•	•	•	•	•	•	•			
- V.92	•	•	•	•	•	•	•	•			
V.42 MNP4 (Error Correction)	•	•	•	•	•	•	•	•			
V.44 V.42bis MNP5 (Compression)	•	•	•	•	•	•	•	•			
V.8 V.8bis (Negotiation)	•	•	•	•	•	•	•	•			
HDLC	•	•	•	•	•	•	•	•			
Relay: V.150.1 (MoIP)	•	•	•	•	•	•	•	•			
Fax (Pumps)											
- V.17	•	•	•	•	•	•	•	•	•	•	•
- V.21				*							
- V.27ter	•	•	•	•	•	•	•	•	•	•	•
- V.29	•	•	•	•	•	•	•	•	•	•	•
Relay: T.38/T.30 (FoIP)	•	•	•	•	•	•	•	•	•	•	•

• = Available

MSC7100 AND MSC8100 APPLICATION SOFTWARE (continued)

MSC7100, MSC8100 Software Modules (continued)

Application/Module	MSC7116	MSC7118	MSC7119	MSC7120	MSC8112	MSC8113	MSC8122	MSC8126	MSC8144	MSC8144E	MSC8144EC
Echo Cancellation											
G.165/G.168 (24 ms)	*	*	*	*	*	*	*	*			
G.168 2002 (128 ms, windowed)	*	*	*	*	*	*	*	*			
G.168 (32 ms)				*							
G.169 Acoustic Level Control	*	*	*	*	*	*	*	*			
Noise Reduction	*	*	*	*	*	*	*	*			
Telephony Support											
DTMF Detect	*	*	*	*	*	*	*	*	*	*	*
Universal Tone Generation	*	*	*	*	*	*	*	*	*	*	*
Special Tone Generation	*	*	*	*	*	*	*	*			
Special Tone Event Detect	*	*	*	*	*	*	*	*			
VAD/CNG	*	*	*	*	*	*	*	*	*	*	*
PLC	*	*	*	*	*	*	*	*	*	*	*
RTP packetization	*	*	*	*	*	*	*	*	*	*	*
Security											
AES	*	*	*	*	*	*	*	*			
RTOS											
DMA Handler	*	*	*	*	*	*	*	*	*	*	*
TDM Drivers	*	*	*	*	*	*	*	*	*	*	*
DSI Host Port Drivers	*	*	*		*	*	*	*			
HDI16/DSI Host Port Drivers	*	*	*		*	*	*	*			
Smart DSP OS Scheduler	*	*	*	*	*	*	*	*	*	*	*
Memory Allocation	*	*	*	*	*	*	*	*	*	*	*
Interrupt Handling	*	*	*	*	*	*	*	*	*	*	*
UDP	*	*	*	*	*	*	*	*	*	*	*
DHCP Client	*	*	*	*	*	*	*	*	*	*	*
RTP	*	*	*	*	*	*	*	*	*	*	*
DSI Slave Driver					*	*	*	*			
HDI16 Slave Port Drivers					*	*	*	*			
Ethernet Driver	*	*	*	*	*	*	*	*	*	*	*
UART	*	*	*	*	*	*	*	*	*	*	*
Drivers											
Ethernet Drivers	*	*	*	*	*	*	*	*	*	*	*
TDM Drivers	*	*	*	*	*	*	*	*	*	*	*
ATM AAL 1, 2, 5 Drivers					*	*	*	*			
HDI16/DSI Port Drivers					*	*	*	*			
Bridge Drivers				*							

* = Available

MSC7100 AND MSC8100 APPLICATION SOFTWARE (continued)

MSC7100, MSC8100 Software Modules (continued)

Application/Module	MSC7116	MSC7118	MSC7119	MSC7120	MSC8112	MSC8113	MSC8122	MSC8126	MSC8144	MSC8144E	MSC8144EC
Drivers (continued)											
LAN Drivers				.							
PON Drivers				.							

. = Available

56F800/56F820 APPLICATION SOFTWARE

56F800/56F820 Software Modules

Beans	56F801 ¹	56F802 ¹	56F803	56F805	56F807	56F826	56F827	56F800 Demo
Vocoders								
G.711
G.726
Modem Algorithms								
V.8bis			
V.21			
V.22bis			
V.42bis			
Telephony								
G.165
G.168
Caller ID
DTMF Generate
DTMF Detect
Caller ID
Call Progress Tones (CPT)
Voice Activity Detect (VAD)
CAS Detection
Acoustic Echo Canceller			
Common Tone Generation
MFC - R2
DSP Functions								
Fractional Math
FFT
FIR
IIR
Trigonometric

. = Available

1. 60 MHz 56F801 and 56F802 parts are also supported.

2. Component is priced separately, contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for more information.

56F800/56F820 APPLICATION SOFTWARE (continued)

56F800/56F820 Software Modules (continued)

Beans	56F801 ¹	56F802 ¹	56F803	56F805	56F807	56F826	56F827	56F800 Demo
DSP Functions (continued)								
Matrix	•	•	•	•	•	•	•	•
Vector	•	•	•	•	•	•	•	•
Correlation	•	•	•	•	•	•	•	•
Voice Recognition								
VRLite-1 ²			•	•	•	•	•	
Security								
DES	•	•	•	•	•	•	•	•
3DES	•	•	•	•	•	•	•	•
RSA	•	•	•	•	•	•	•	•
Drivers for On-Chip Peripherals								
ADC	•	•	•	•	•		•	•
Quadrature Decoder			•	•	•			
Flash	•	•	•	•	•	•	•	•
GPIO	•	•	•	•	•	•	•	•
Interrupt Controller	•	•	•	•	•	•	•	•
MSCAN ²			•	•	•			
PLL	•	•	•	•	•	•	•	•
Posix Timer	•	•	•	•	•	•	•	•
PWM	•	•	•	•	•			•
Quad Timer	•	•	•	•	•	•	•	•
Serial/SCI	•	•	•	•	•	•	•	•
SIM	•	•	•	•	•	•	•	•
SPI	•		•	•	•	•	•	•
SSI						•	•	
TOD						•	•	
Drivers for Off-Chip Peripherals on EVMs								
I ² C	•	•	•	•	•	•	•	•
Terminal	•	•	•	•	•	•	•	•
BLDC	•	•	•	•	•			•
Brake	•	•	•	•	•			•
Button	•	•	•	•	•	•	•	•
Codec						•	•	
EEPROM/Flash (SPI Bus Serial)						•	•	
LED	•	•	•	•	•	•	•	•
Switch	•	•	•	•	•			•

• = Available

1. 60 MHz 56F801 and 56F802 parts are also supported.

2. Component is priced separately, contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for more information.

56F800/56F820 APPLICATION SOFTWARE (continued)

56F800/56F820 Software Modules (continued)

Beans	56F801 ¹	56F802 ¹	56F803	56F805	56F807	56F826	56F827	56F800 Demo
Tools								
PC Master	•	•	•	•	•	•	•	•
File I/O	•	•	•	•	•	•	•	•
JTAG Flash Loader	•	•	•	•	•	•	•	•
RTOS Support								
MicroC/OS-II			•	•	•	•	•	
Miscellaneous								
Serial Bootloader	•	•	•	•	•	•	•	•
Data Structures (FIFO)	•	•	•	•	•	•	•	•
Cycle Count				•	•	•	•	
Stack Check	•	•	•	•	•	•	•	•
Test	•	•	•	•	•	•	•	•
Motor Control Applications								
AC Induction Motors (ACIM) V/Hz Closed Loop				•				
Brushless DC Motors w/Encoder				•				
Digital Power Factor Correction				•				
Motor Control Algorithms								
Three-Phase Sine Waveform Generation	•	•	•	•	•			•
Clarke/Park Transformation	•	•	•	•	•			•
Space Vector Modulation	•	•	•	•	•			•
Ramp	•	•	•	•	•			•
D-Q System (Two-Phase)	•	•	•	•	•			•
FOC Decoupling	•	•	•	•	•			•
BLDC Commutation Handler w/Sensors	•	•	•	•	•			•
BLDC Commutation Handler Sensorless – Zero Cross	•	•	•	•	•			•
SR Commutation Handler	•	•	•	•	•			•
PI/PID Controllers	•	•	•	•	•			•
Velocity Calculation and Estimation	•	•	•	•	•			•
Look-up Table	•	•	•	•	•			•
Brake Control	•	•	•	•	•			•
Switch Control	•	•	•	•	•			•

• = Available

1. 60 MHz 56F801 and 56F802 parts are also supported.

2. Component is priced separately, contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for more information.

56F800/56F820 APPLICATION SOFTWARE (continued)

56F800/56F820 Software Modules (continued)

Beans	56F801 ¹	56F802 ¹	56F803	56F805	56F807	56F826	56F827	56F800 Demo
Example/Test Applications								
CODEC							•	
DTMF Generation							•	
DTMF Detection							•	
G.165							•	
G.711							•	
G.726							•	
VRLite-1 ²							•	
DES				•			•	
3DES				•			•	
RSA				•			•	
Frequency Detector								•
Frequency Spectrum								•
Pot Controlled LED								•
V42				•			•	
vad							•	
CTG							•	
Acoustic Echo Canceller				•				
CAS Detect				•				
Call ProgressTone				•				
Common Tone Generation				•				
Brake Control				•				
Clark Park				•				
Decoupling				•				
Dqestabl				•				
Flux Model				•				
Wave Generate				•				
Phase Flux Estimation				•				
Space Vector Modulation				•				
DSP Functions								
Fractional Math				•				
FFT				•				
FIR				•				
IIR				•				
Trigonometric				•				
Matrix				•				
Vector				•				
Correlation				•				

• = Available

1. 60 MHz 56F801 and 56F802 parts are also supported.

2. Component is priced separately, contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for more information.

56F850 APPLICATION SOFTWARE

56F850 Software Modules

Beans	56F852	56F853	56F854	56F855	56F857	56F858
Vocoders						
G.711
G.723.1a ¹
G.726
G.729A/B ¹
Modem Algorithms						
V.8bis
V.21
V.22bis
V.42bis ¹
Telephony						
G.165
G.168
DTMF Generate
DTMF Detect
Caller ID
Call Progress Tones (CPT)
Voice Activity Detect (VAD)
CAS Detection
Acoustic Echo Canceller
Common Tone Generation
Noise Suppression Library
Automatic Gain Control
MFC - R2
VAD/CNG/DTX
Voice Recognition						
VRLite-1 ¹
Feature Phone Application						
Type 1 and 2 Telephony Features ¹
Generic Echo Canceller ¹
Full Duplex Speakerphone ¹
Type 1 and 2 Telephony Parser ¹

• = Present in PE.

1. Component is priced separately, contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for more information.

56F850 APPLICATION SOFTWARE (continued)

56F850 Software Modules (continued)

Beans	56F852	56F853	56F854	56F855	56F857	56F858
Security						
DES
3DES
RSA
DSP Functions						
Fractional Math
FFT
FIR
IIR
Trigonometric
Matrix
Vector
Correlation
Drivers for On-Chip Peripherals						
GPIO
Interrupt Controller
PLL
Posix Timer
Quad Timer
SCI
SPI
ESSI/SSI
ESSI DMA
EMI (PCS)
Host Port Interface
TOD
Drivers for Off-Chip Peripherals						
I ² C
Terminal
CODEC
LED
Button
RTOS Support						
MicroC/OS-II (Port Files Only)

. = Present in PE.

1. Component is priced separately, contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for more information.

56F850 APPLICATION SOFTWARE (continued)

56F850 Software Modules (continued)

Beans	56F852	56F853	56F854	56F855	56F857	56F858
Miscellaneous						
Testing and Stack Services
Data Structures (FIFO)
Second Stage SPI Boot Loader
Cycle Count Tool
Example/Test Applications						
CODEC						.
DTMF Generation						.
DTMF Detection						.
G.165						.
G.168						.
G.711						.
G.723.1a ¹						.
G.726						.
G.729A/B ¹						.
VRLite-1 ¹						.
DES						.
3DES						.
RSA						.
Second Stage SPI Boot Loader
Host Interface Demo						
V.22bis						.
V.42bis						.
VAD						.
CPT						.
AGC						.
Noise Suppression						.
CTG						.
V8						.
Tools						
Serial Data Flash Programmer
PC Master Software
File I/O
Reference Applications						
Feature Phone Application ¹						.

. = Present in PE.

1. Component is priced separately, contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for more information.

56F850 APPLICATION SOFTWARE (continued)

56F850 Software Modules (continued)

Beans	56F852	56F853	56F854	56F855	56F857	56F858
DSP Functions						
Fractional Math						.
FFT						.
FIR						.
IIR						.
Trigonometric						.
Matrix						.
Vector						.
Correlation						.

. = Present in PE.

1. Component is priced separately, contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for more information.

56F8300/56F8100 APPLICATION SOFTWARE

56F8300/8100 Software Modules

Beans	F8322/ F8122	F8323/ F8123	F8335/ F8135	F8345/ F8145	F8346/ F8146	F8347/ F8147	F8355/ F8155	F8356/ F8156	F8357/ F8157	F8365/ F8165	F8366/ F8166	F8367/ F8167	56F8300 Demo
Vocoders													
G.711
G.726
Modem Algorithms													
V.8bis
V.21
V.22bis													
V.42bis
Telephony													
G.165
G.168
DTMF Generate
DTMF Detect
Caller ID
Call Progress Tones (CPT)
Voice Activity Detect (VAD)
CAS Detection
Acoustic Echo Canceller
Common Tone Generation

. = Available

1. Component is priced separately, contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for more information.

56F8300/56F8100 APPLICATION SOFTWARE (continued)

56F8300/8100 Software Modules (continued)

Beans	F8322/ F8122	F8323/ F8123	F8335/ F8135	F8345/ F8145	F8346/ F8146	F8347/ F8147	F8355/ F8155	F8356/ F8156	F8357/ F8157	F8365/ F8165	F8366/ F8166	F8367/ F8167	56F8300 Demo
DSP Functions													
Fractional Math
FFT
FIR
IIR
Trigonometric
Matrix
Vector
Correlation
Voice Recognition													
VRLite-1 ¹
Security													
DES
3DES
RSA
Drivers for On-Chip Peripherals													
ADC
Quadrature Decoder
Flash
GPIO
Interrupt Controller
FlexCAN ¹
PLL
Posix Timer
PWM
Quad Timer
Serial/SCI
SPI
TOD (Time OF Day)
Drivers for Off-Chip Peripherals on EVMs													
I ² C
Terminal
Button
PC Master
File I/O
LED
Switch

• = Available

1. Component is priced separately, contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for more information.

56F8300/56F8100 APPLICATION SOFTWARE (continued)

56F8300/8100 Software Modules (continued)

Beans	F8322/ F8122	F8323/ F8123	F8335/ F8135	F8345/ F8145	F8346/ F8146	F8347/ F8147	F8355/ F8155	F8356/ F8156	F8357/ F8157	F8365/ F8165	F8366/ F8166	F8367/ F8167	56F8300 Demo
Tools													
PC Master
File I/O
JTAG Flash Loader
RTOS Support													
MicroC/OS-II
Miscellaneous													
Serial Bootloader
Data Structures (FIFO)
Cycle Count
Stack Check
Test
Motor Control Applications													
Brushless DC Motors w/Encoder					.				.			.	
AC Induction Motors (ACIM) V/Hz Closed Loop					.								
Digital Power Factor Correction					.								
Motor Control Algorithms													
3-phase Sine Waveform Generation
Clarke/Park Transformation
Space Vector Modulation
Ramp
D-Q System (2 Phase)
FOC Decoupling
BLDC Commutation Handler w/Sensors
BLDC Commutation Handler Sensorless – Zero Cross
SR Commutation Handler
PI/PID Controllers
Velocity Calculation and Estimation
Look-up Table
Brake Control
Switch Control
Example Applications													
efield													.
Voice Recording and Playback													.
Temp Sensor													.

. = Available

1. Component is priced separately, contact your local Freescale Semiconductor Sales Office or authorized Freescale Semiconductor distributor for more information.

56F8000 APPLICATION SOFTWARE

56F8000 Software Modules

Beans	56F8013	56F8014
DSP Functions		
Fractional Math	▪	▪
FFT	▪	▪
FIR	▪	▪
IIR	▪	▪
Trigonometric	▪	▪
Matrix	▪	▪
Vector	▪	▪
Correlation	▪	▪
Drivers for On-Chip Peripherals		
ADC	▪	▪
Flash	▪	▪
GPIO	▪	▪
Interrupt Controller	▪	▪
PLL	▪	▪
PWM	▪	▪
Quad Timer	▪	▪
Serial/SCI with LIN	▪	▪
SPI	▪	▪
I ² C	▪	▪
Drivers for Off-Chip Peripherals on EVMs		
Terminal	▪	▪
Button	▪	▪
PC Master	▪	▪
LED	▪	▪
Tools		
PC Master	▪	▪

▪ = Available

Beans	56F8013	56F8014
Miscellaneous		
Serial Bootloader	▪	▪
Data Structures (FIFO)	▪	▪
Cycle Count	▪	▪
Stack Check	▪	▪
Test	▪	▪
Motor Control Applications		
Brushless DC Motors w/Hall Sensor	▪	
Motor Control Algorithms		
3-Phase Sine Waveform Generation	▪	▪
Clarke/Park Transformation	▪	▪
Space Vector Modulation	▪	▪
Ramp	▪	▪
D-Q System (2-Phase)	▪	▪
FOC Decoupling	▪	▪
BLDC Commutation Handler w/Sensors	▪	▪
BLDC Commutation Handler Sensorless-Zero Cross	▪	▪
SR Commutation Handler	▪	▪
PI/PID Controllers	▪	▪
Velocity Calculation and Estimation	▪	▪
Look-up Table	▪	▪
Brake Control	▪	▪
Switch Control	▪	▪

▪ = Available

ECOSYSTEM PARTNERS

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www.freescale.com/codewarrior

Lauterbach
www.lauterbach.com

Macraigor Systems
www.macraigor.com

Quantic EMC
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RTOS

Freescale Semiconductor
www.freescale.com/codewarrior

Enea OSE Systems
www.enea.com

Express Logic
www.expresslogic.com

Quadros Systems
www.quadros.com

Telecom Applications

Arraycomm
www.arraycomm.com

Encore Software
www.ncoretech.com

Global IP Sound Inc
www.globalipsound.com

Ittiam
www.ittiam.com

Vianix
www.vianix.com

Libraries

Freescale Semiconductor
www.freescale.com/codewarrior

Training

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Global IP Sound Inc
www.globalipsound.com

Ittiam
www.ittiam.com

Multi Video Designs
www.mvd-fpga.com

HILF GmbH
www.hilf.de

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www.astc-design.com

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Embedded Planet
www.embeddedplanet.com
KTEC
www.ktec.co.il

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North Shore Circuit Design
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Nuvation Engineering
www.nuvation.com

PA Consulting
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www.phybit.com
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www.solec.net

Spectrum Design Solutions Inc
www.spectrumdsi.com
Time Domain Systems Inc.
www.tdsysi.com
Vanteon
www.vanteon.com

Audio/Video Applications

On2 Technologies Inc.
www.on2.com

PRODUCT ABBREVIATIONS

AC	Alternating Current	ITU	International Telecommunications Union
AC3	Project name for Dolby Digital Decoder	LDC	Literature Distribution Center
ADC	Analog to Digital Converter	LQFP	Low-Profile Quad Flat Package
ALU	Arithmetic Logic Unit	MFT	Multi-Function Timer
ATM	Asynchronous Transfer Mode	MIPS	Million Instructions per Second
BLDC	Brushless DC	MOQ	Minimum Order Quantity
CAN	Controller Area Network	MPEG	Motion Picture Experts Group (compression standard)
CDMA	Code Division Multiple Access	OnCE	On-Chip Emulation Port/Module
Ch	Channel	P	In Production
Codec	Compression/Decompression (algorithm)	PBGA	Plastic Ball Grid Array
COP	Computer Operating Properly (Watch Dog Timer)	PCM	Pulse Code Modulation
DAX	Digital Audio Transmitter	PLL	Phase-Lock Loop
DC	Direct Current	PPP	Post Processing Phase
DES	Data Encryption Standard (USA)	PQFP	Plastic Quad Flat Package
DTS	Digital Theater Systems	PWM	Pulse Width Modulator
DTV	Digital Television	S	Samples available
DVD	Digital Versatile Disk	SCI	Serial Communications Interface (asynchronous)
EFCOP	Enhanced Filter Co-Processor	SHI	Serial Host Interface
EMI	External Memory Interface	SPI	Serial Peripheral Interface
ESAI	Enhanced Serial Audio Interface	SR	Switched Reluctance
FFT	Fast Fourier Transform	SSI	Single-Step Instruction
Freq	Frequency in megahertz	THX	Lucasfilm sound processing algorithm
GPIO	General-Purpose I/O	TOD	Time of Day
GSM	Ground Station Mobile	TQFP	Thin Quad Flat Package
HI08	8-bit Host Interface	USB	Universal Serial Bus
I/O	Bidirectional Input and Output Port Pins	www	World Wide Web
IP	Internet Protocol		

NOTES

NOTES

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