MAX5880

High-Density Downstream Cable QAM Modulator and Digital Upconverter

Scalable DUC for DOCSIS 3.0-Compliant Edge QAM Devices Generates Up to 128 QAM Channels at 26mW/QAM

Request Full Data Sheet

Description

The MAX5880 high-density downstream cable QAM modulator and digital upconverter (DUC) performs QAM mapping, pulse shaping, and digital RF upconversion of forward-error-correction (FEC)-encoded data with full agility. The device drives an RF digital-to-analog converter (RF-DAC) to digitally synthesize RF signals with up to 128 DOCSIS-compliant 6MHz QAM channels (or up to 96 8MHz QAM channels) on a single RF port. The DUC device and Maxim's RF-DACs provide high-density QAM modulation with very low power dissipation in a compact 17mm x 17mm footprint.

The device accepts FEC-encoded CMOS data (symbols) on up to four 10-bit input ports that accept up to 32 time-interleaved digital data streams each. Each channel features an individually configurable QAM mapper, RRC filter, and arbitrary rate resampler (ARR). The device performs pulse shaping, resampling, interpolation and quadrature modulation of input data, supporting all data rates defined in DOCSIS and DVB-C. A cascade of interpolation filters, complex modulators, and channel combiners allow modulation of the signal to any frequency from 45MHz to 1003MHz. Integrated direct digital frequency synthesizers allow positioning of the QAM channels with a resolution of 125Hz. The interpolation filters and resamplers provide linear phase and excellent gain flatness. Output data from the last modulator is fed to a digital-predistortion (DPD) block that can be used to correct distortion in the RF-DAC and output amplifiers. The output interface to the RF-DAC consists of four 14-bit interleaved LVDS buses that operate up to 1250Mwps each.

Key Features

- High-Density: Scalable Up to 128 QAM Channels
  - Factory Preset for 8, 16, 24, 32, 48, 64, 96, or 128 QAM Channels
  - Soft-Key Field-Upgradeable in Steps of 8 QAMs
- RRC Filters Support ITU-T J.83 Annex A, B, and C
- 1MHz to 8MHz Channel Bandwidth
- Full Carrier Agility within Each of Four 192MHz Blocks
  - Block Agility within 950MHz Output Bandwidth
- Reconfigurable Without Service Interruption
- DOCSIS 3.0 DRFI Compliant
- Input Symbol Rate: 1Msym/s to 7.14Msym/s
  - Independently Set for Each Channel
- Integrated QAM Mapper (16/32/64/128/256-QAM)
  - Supports All ITU-T J.83-Defined Constellations
- Four CMOS Input Ports Support Up to 1024-QAM
- Programmable Digital Predistortion
- Four 14-Bit LVDS Output Ports Operate Up to 1250Mwps Each
  - Drives MAX5882 and MAX5879A RF-DACs
- Low-Power Operation
  - 3.3W at 128 (6MHz) QAMs, f_S = 4608Msps

Applications/Uses

- Edge QAM, CMTS, and CCAP
- QAM Modulators for Video Distributio

Key Specs

Part Number	Resolution (bits)	Update Rate (Msps)	Modulation	Capacity Range	Capacity Type	Input Interface	Output Interface	f_{OUT} (MHz)	RF-DAC	P_{DISS} (mW) @ Max Capacity	V_{SUPPLY} (V)	Footprint (mm x mm)	Oper. Temp. (°C)	Package/Pins
MAX5880	14	5000	QAM	8 to 128	Scalable	CMOS	Interleaved LVDS	1250 (2 or 4 ports)	MAX5879 MAX5882	3300	1 1.8	17 x 17	0 to +85	CSBGA/256

Key: *Material Analysis* *Non Cancellable Non Reschedulable* ***NLA***=*No longer available*

Symbols in part number: **+** *Lead-free, RoHS compliant* **–** *Not qualified as lead-free RoHS* **#** *RoHS compliant, lead exemption*

PRICE/UNIT shows budgetary pricing for 1K units. Some parts do not have standard pricing and require a quote.

Part Number	Price /Unit*	Status	Carrier Type	Package
MAX5880AUXF+		NLA	Tray	CSBGA; 256Pin; 292.4mm²; See Material Analysis for RoHS info Temp: 0°C to +85°C
		CHECK ROCHESTER >		
MAX5880BUXF+		NLA	Tray	CSBGA; 256Pin; 292.4mm²; See Material Analysis for RoHS info Temp: 0°C to +85°C
		CHECK ROCHESTER >		
MAX5880CUXF+		NLA	Tray	CSBGA; 256Pin; 292.4mm²; See Material Analysis for RoHS info Temp: 0°C to +85°C
		CHECK ROCHESTER >		
MAX5880DUXF+		NLA	Tray	CSBGA; 256Pin; 292.4mm²; See Material Analysis for RoHS info Temp: 0°C to +85°C
		CHECK ROCHESTER >		
MAX5880EVKIT#	BUY	Last Time Buy	Box	
MAX5880FUXF+		NLA	Tray	CSBGA; 256Pin; 292.4mm²; See Material Analysis for RoHS info Temp: 0°C to +85°C
		CHECK ROCHESTER >		
MAX5880HUXF+		NLA	Tray	CSBGA; 256Pin; 292.4mm²; See Material Analysis for RoHS info Temp: 0°C to +85°C
		CHECK ROCHESTER >		
MAX5880KUXF+		NLA	Tray	CSBGA; 256Pin; 292.4mm²; See Material Analysis for RoHS info Temp: 0°C to +85°C
		CHECK ROCHESTER >		
MAX5880LUXF+		NLA	Tray	CSBGA; 256Pin; 292.4mm²; See Material Analysis for RoHS info Temp: 0°C to +85°C
		CHECK ROCHESTER >		
MAX5880PUXF+	BUY	Active	Tray	CSBGA; 256Pin; 292.4mm²; See Material Analysis for RoHS info Temp: 0°C to +85°C