

**I/Q Modulator/Demodulator
850-960 MHz**

MAMO-000900-1291HT

V1

Features

- Excellent Carrier Suppression ~34dBc
- 6.0 dB Typical Modulator Conversion Loss
- +17 to +20 dBm LO Drive
- High 3x1 and 5x1 Harmonic Suppression
- No External Matching Required
- Low Cost Miniature Plastic MLP Package
- Lead Free and RoHS Compliant

Description and Application

M/A-COM's MAMO-000900-1291HT is a silicon monolithic 850-960 MHz, medium barrier, I/Q Modulator/Demodulator. Encapsulated in a low cost, miniature surface mount PQFN 6mm square, 28-lead plastic package the die utilizes M/A-COM's unique HMIC silicon/glass process. This process enables the realization of low loss passive elements and efficient diode technology which in turn provides excellent harmonic suppression. In addition, the incorporated monolithic design techniques provide unparalleled amplitude and phase imbalance performance during demodulation thus adding to the unit's overall versatility.

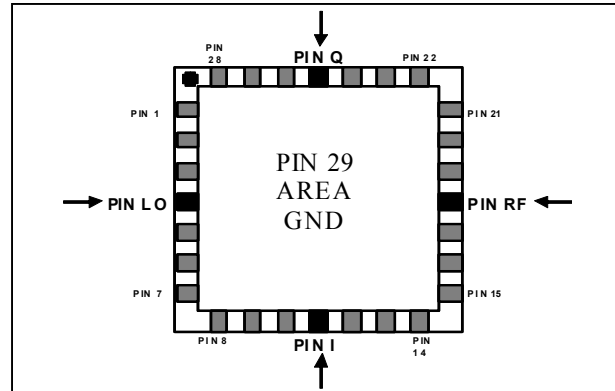
These modulators/demodulators are well suited for GSM and CDMA Cellular basestation applications, as well as most RFID systems, particularly where small size and high performance are required. Typical applications include quadrature modulation requirements in wireless receivers and transmitters.

Absolute Maximum Ratings¹

Parameter	Maximum Ratings
Operating Temperature	-40 °C to +85 °C
Storage Temperature	-65 °C to +150 °C
Incident LO Power	+20 dBm C.W.
Incident RF Power	+20 dBm C.W.

1. Exceeding these limits may cause permanent damage.

**MLP 6mm Package
Circuit Side View**



PIN Configuration²

PIN	Function	PIN	Function
1	GND	15	GND
2	GND	16	GND
3	GND	17	GND
4	LO	18	RF
5	GND	19	GND
6	GND	20	GND
7	GND	21	GND
8	GND	22	GND
9	GND	23	GND
10	GND	24	GND
11	I	25	Q
12	GND	26	GND
13	GND	27	GND
14	GND	28	GND

2. The exposed pad centered on the package bottom must be connected to RF and DC ground. (For PQFN Packages)

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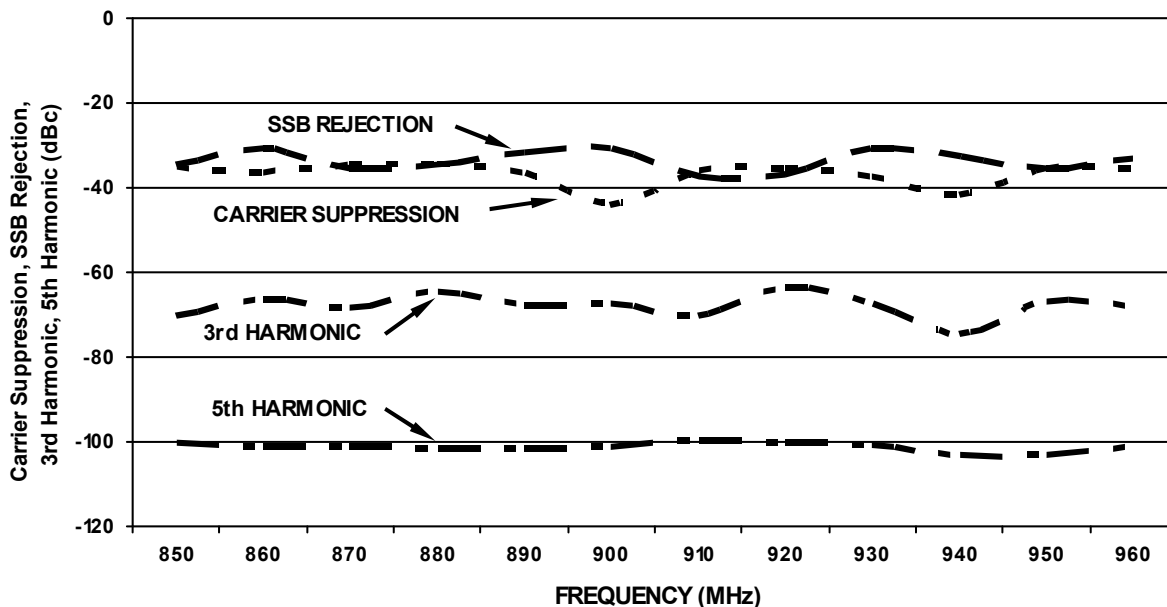
Electrical Specifications (Modulator): T_A = 25°C, Z₀ = 50Ω

Parameter	Frequency Range	Test Conditions	Units	Min	Typ	Max
Output Power	900 MHz 850-960 MHz	LO Drive = +19 dBm I/Q = -7 dBm, I/Q = 400 kHz	dBm	-14.5 -15	-13.5 -14	- -
LO Carrier Suppression	850-960 MHz	LO Drive = +19 dBm I/Q = -7 dBm, I/Q = 400 kHz	dBc	29 -	34 -	- -
SSB Rejection ³	850-960 MHz	LO Drive = +19 dBm I/Q = -7 dBm, I/Q = 400 kHz	dBc	30 -	36 -	- -
3 x 1 Harmonic Suppression	850-960 MHz	LO Drive = +19 dBm I/Q = -7 dBm, I/Q = 400 kHz	dBc	58 -	68 -	- -
5 x 1 Harmonic Suppression	850-960 MHz	LO Drive = +19 dBm I/Q = -7 dBm, I/Q = 400 kHz	dBc	85 -	89 -	- -
ACPR CDMA 2000 ⁴	900 MHz Carrier Freq	LO Drive = +19 dBm BB AC Voltage = 275mVp-p	dBc	72 -	77 -	- -
Output Noise Floor	850-960 MHz	LO Drive = +19 dBm I/Q Power level = -7 dBm	dBm/Hz	- -	-161 -	- -
LO Port Return Loss	850-960 MHz	LO Drive = +19 dBm I/Q Power level = -7 dBm	dB	19 -	26 -	- -
RF Port Return Loss	850-960 MHz	LO Drive = +19 dBm I/Q Power level = -7 dBm	dB	6 -	9 -	- -
IF Bandwidth	850 ≤ LO ≤ 970 MHz	LO Drive = +19 dBm I/Q Power level = -7 dBm	MHz	65 -	- -	- -

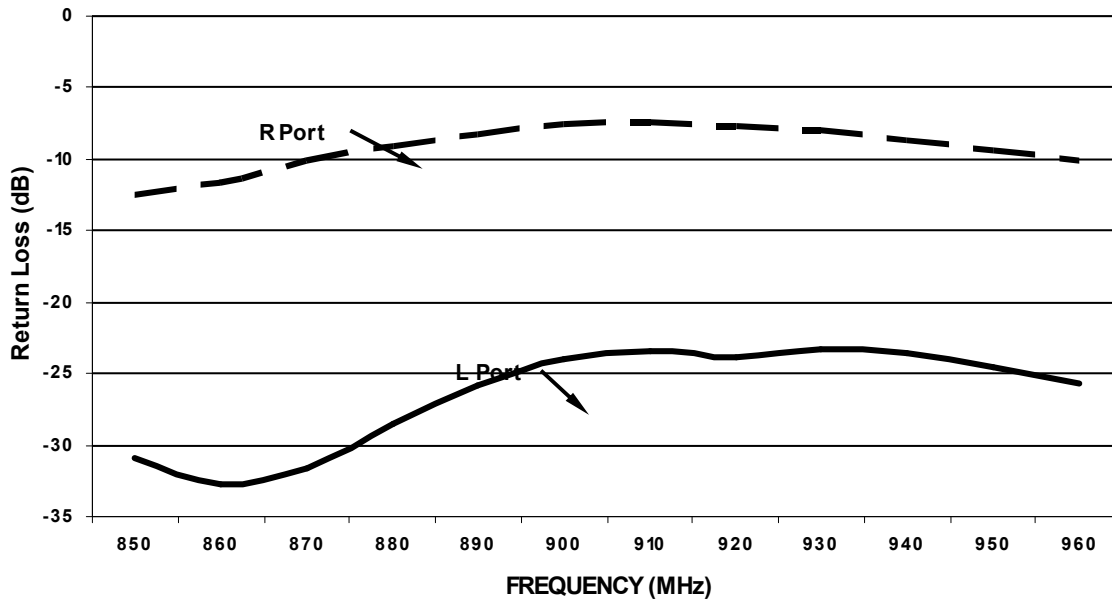
3. When the LO frequency is greater than the RF frequency, the upper sideband is suppressed.

4. The Baseband I and Q input signals were generated using the "Forward CDMA2000 SR1 Pilot, IS-95 Mod w/EQ, PRE Clip: 100%" settings in the Agilent E3844C.

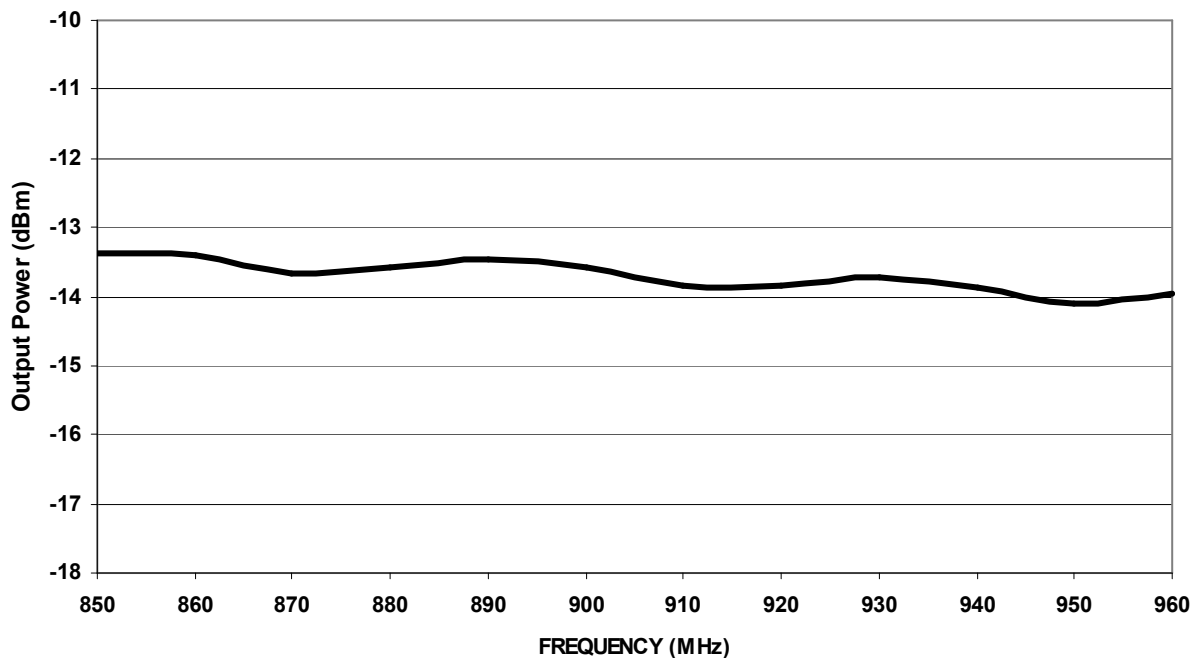
Modulator Band Performance 850-960 MHz



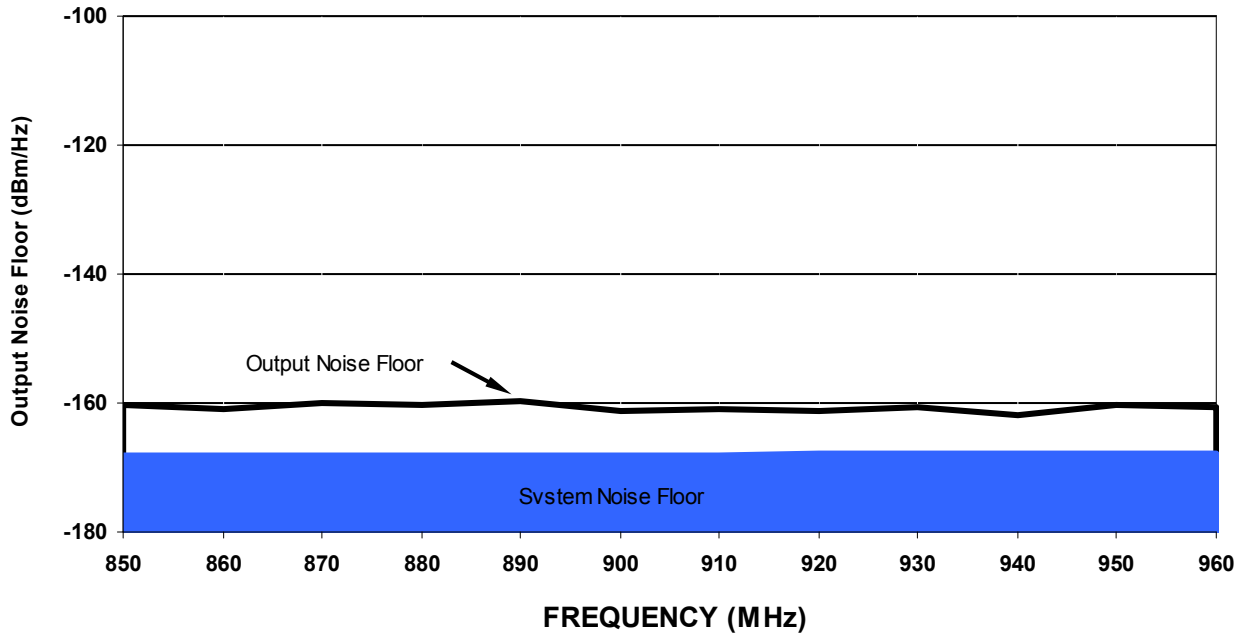
Modulator/Demodulator Return Loss 850-960 MHz



Output Power 850-960 MHz



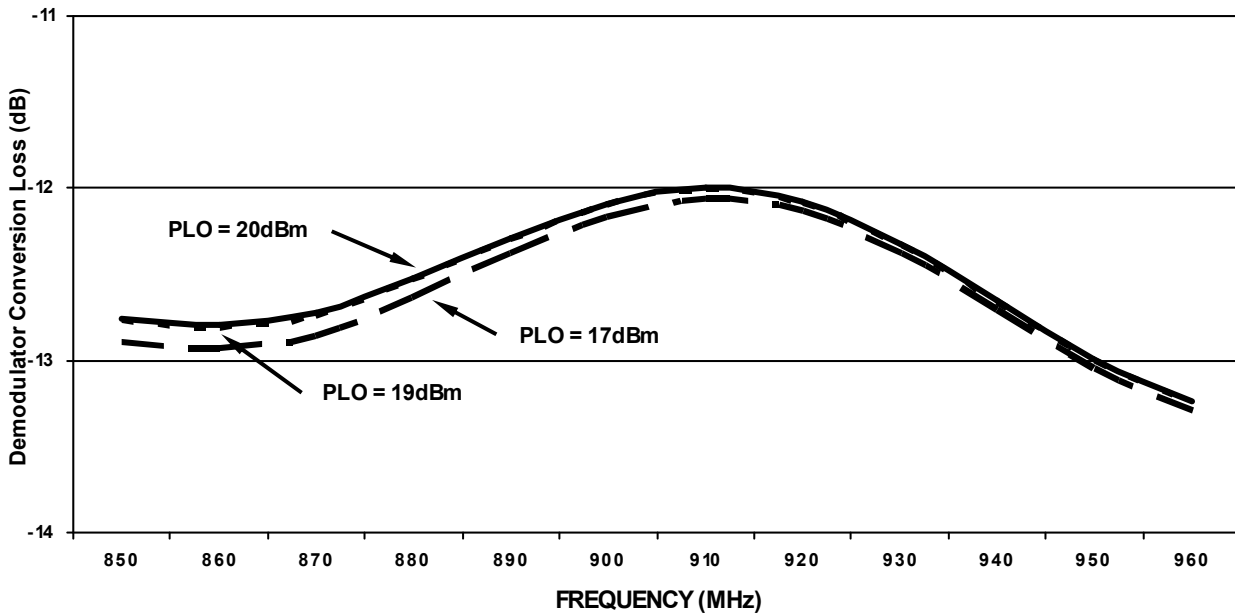
Output Noise Floor



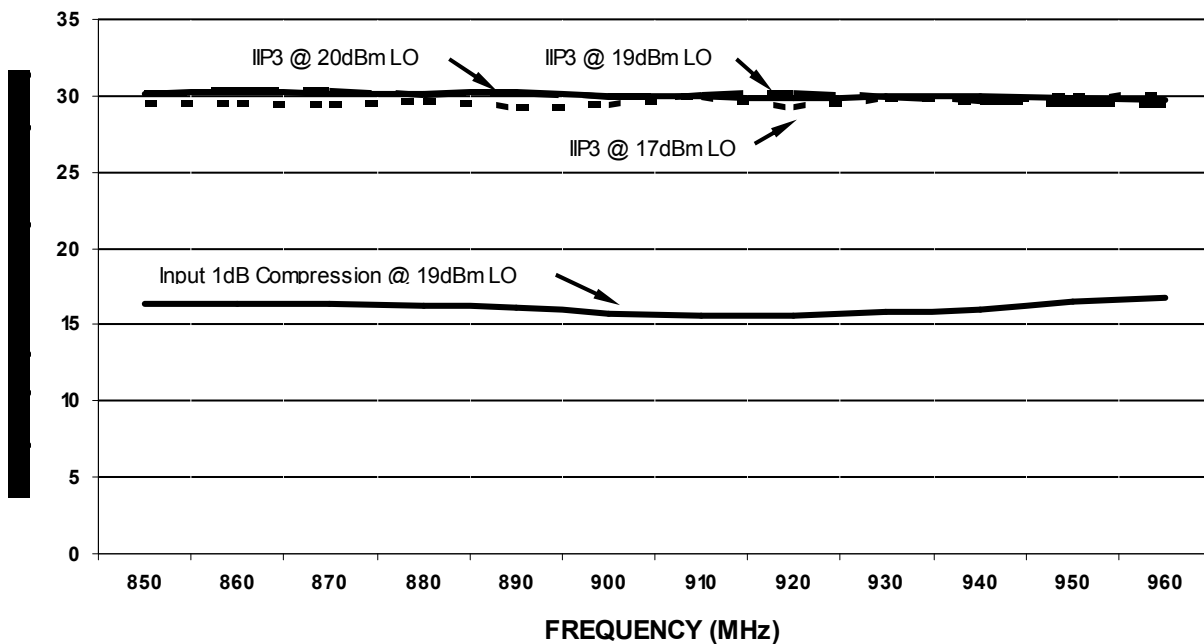
Electrical Specifications (Demodulator) @ +25 °C

Parameter	Frequency Range	Test Conditions	Units	Min	Typ	Max
Conversion Loss	900 MHz 850-960 MHz	LO Drive = +19 dBm	dB	- -	12 12.6	13 14
Amplitude Imbalance	850-960 MHz	LO Drive = +19 dBm Freq offset = 400 kHz	dB	- -	0.05 -	0.3 -
Phase Imbalance	850-960 MHz	LO Drive = +19 dBm Freq offset = 400 kHz	deg	- -	1.0 -	3.0 -
Input IP3	850-960 MHz	LO Drive = +19 dBm Freq offset = 400 kHz	dBm	27.5 -	30 -	- -
Input 1dB Compression	900 MHz 850-960 MHz	LO Drive = +19 dBm	dBm	14.5 -	16 -	- -
LO Return Loss	850-960 MHz	LO Drive = +19 dBm	dB	19 -	26 -	- -
RF Return Loss	850-960 MHz	LO Drive = +19 dBm RF Power Level = -10 dBm	dB	6 -	9 -	- -

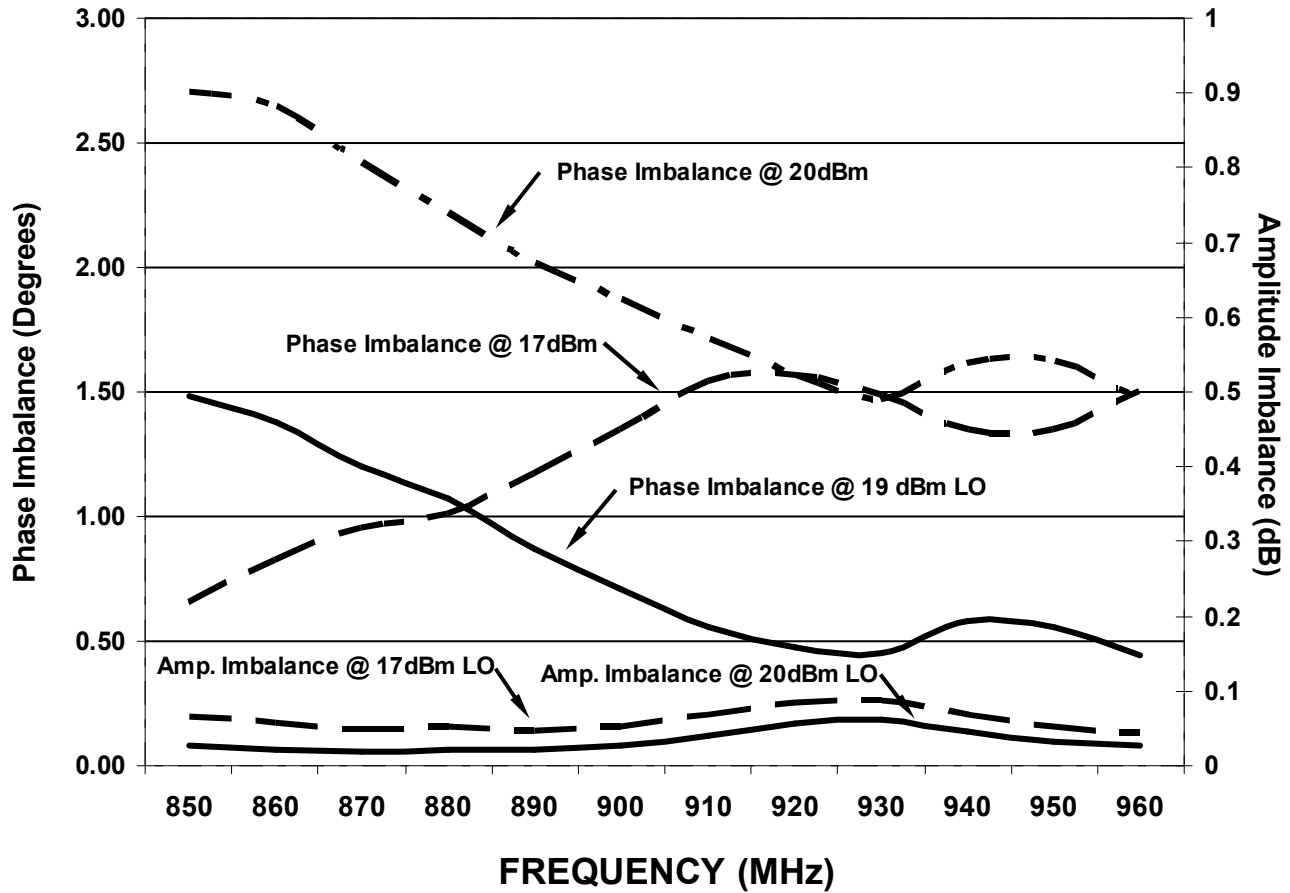
Demodulator Conversion Loss 850-960 MHz



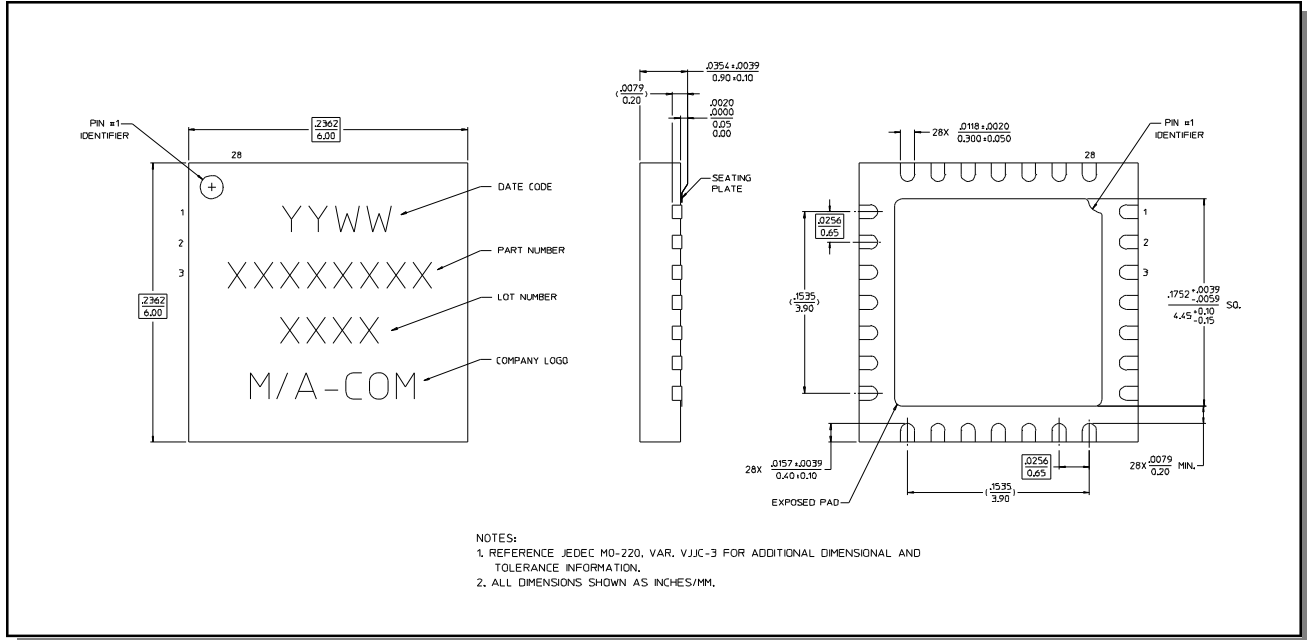
Demodulator Input IP3 and Input 1dB Compression 850-960 MHz



Demodulator Phase and Amplitude Imbalance 850-960 MHz



MAMO-000900-1291MT Outline – 6mm PQFN, 28-Lead



Ordering Information

Part Number	Package
MAMO-000900-1291HT	Tape and Reel