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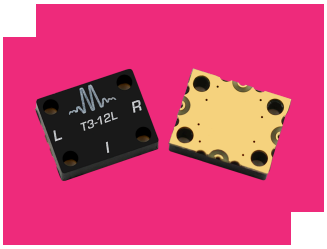
T3-12GLCQG-1

Two-Tone-Terminator Mixer

DEVICE OVERVIEW

General Description

The T3-12 is a high performance mixer featuring LO/RF from 10 MHz to 12 GHz and IF from 1 MHz to 4 GHz. As with all T3 mixers, this mixer offers unparalleled nonlinear performance in terms of IIP3, P1dB, and spurious performance with a flexible LO drive requirement from +15 dBm to +27 dBm. The T3-12 is offered in connectorized, surface mount, and drop-in style packaging, suitable for any type of system level integration.



Features

- Ultra-Broadband RF, LO, and IF
- Compatible with Sine or Square-Wave LO
- Square-Wave LO delivers Industry-Leading Spurious, IP3, and P_{1dB} Performance

Applications

N/A

Functional Block Diagram

N/A

Part Ordering Options

Part Number	Description	Package	Green Status	Product Lifecycle	Export Classification
T3-12GLCQG-1	Two-Tone-Terminator Mixer	CQG	REACH RoHS	Released	EAR99

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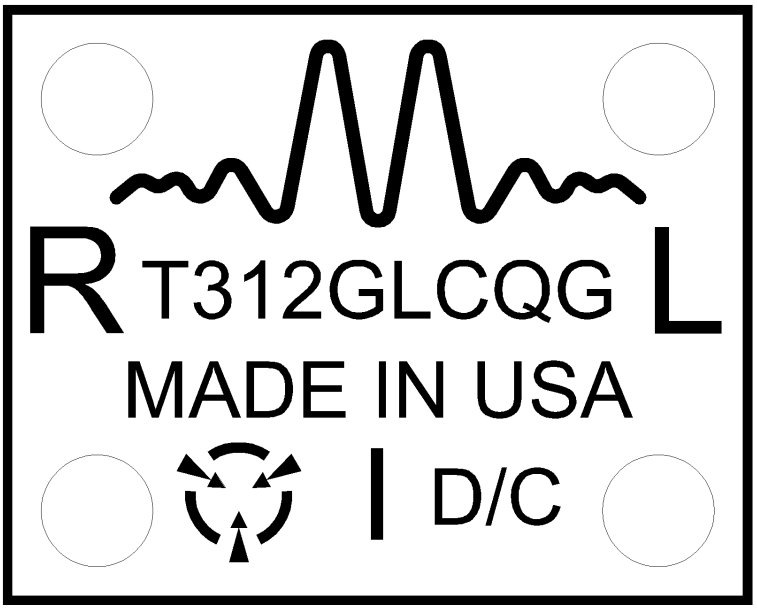
Revision History

Revision Code	Revision Date	Comment
-	2026-11-19	Initial Release

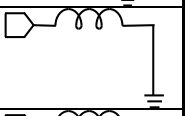
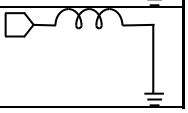
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Port Configuration and Functions

Port Diagram



Port Functions

Port	Function	Description	DC Equivalent Circuit
IF	IF	The IF port is DC blocked and AC matched to 50 Ohms from 1 MHz to 4 GHz.	
RF	RF	The RF port is DC short to ground and AC matched to 50 Ohms from 10 MHz to 12 GHz. Blocking capacitor is optional.	
LO	LO	The LO port is DC short to ground and AC matched to 50 Ohms from 10 MHz to 12 GHz. Blocking capacitor is optional.	

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Specifications

Absolute Maximum Ratings

Parameter	Maximum Rating	Unit
LO DC Current	1	Amp
Maximum Operating Temperature	100	°C
Maximum Storage Temperature	125	°C
Minimum Operating Temperature	-55	°C
Minimum Storage Temperature	-65	°C
RF DC Current	1	Amp
RF Power Handling (RF+LO)	25	dBm

Package Information

Parameter	Details	Rating
ESD	250 to < 500 Volts	HBM Class 1A
Dimensions	-	10.16 x 8.13 mm

Recommended Operating Conditions

Parameter	Min	Nominal	Max	Unit
LO Input Power	15	-	25	-

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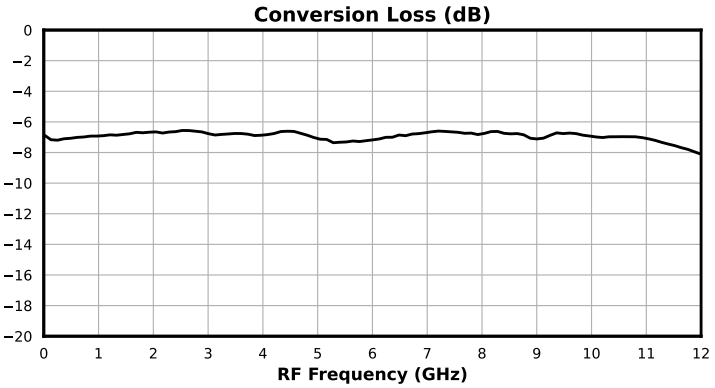
Electrical Specifications

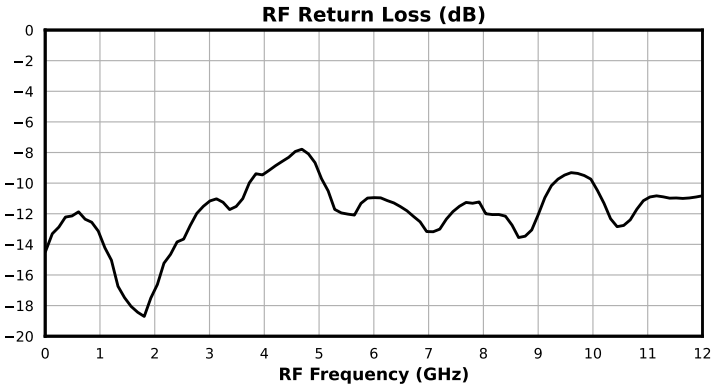
Specifications guaranteed from -55 to +100°C, measured in a 50Ω system.

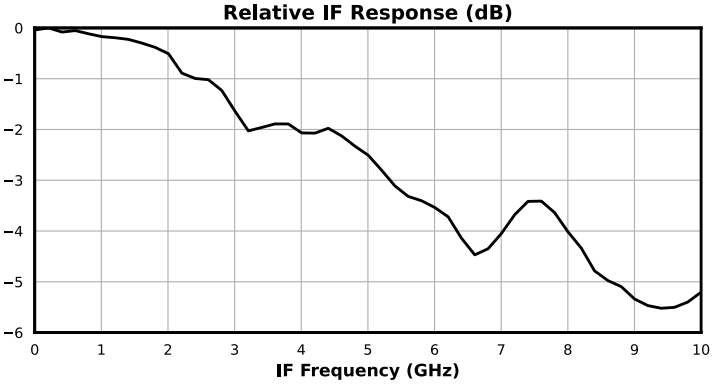
Parameter	Test Conditions	Min	Typ	Max	Unit
Conversion Loss	LO/RF=0.01-12GHz IF=0.001-0.5GHz	-	7	8	dB
Conversion Loss	LO/RF=0.01-12GHz IF=0.5-4GHz	-	8	10	dB
IF Frequency Range	-	0.001	-	4	GHz
Input IP3	-	-	30	-	dBm
LO Frequency Range	-	0.01	-	12	GHz
LO-RF Isolation	-	-	30	-	dB
RF Frequency Range	-	0.01	-	12	GHz

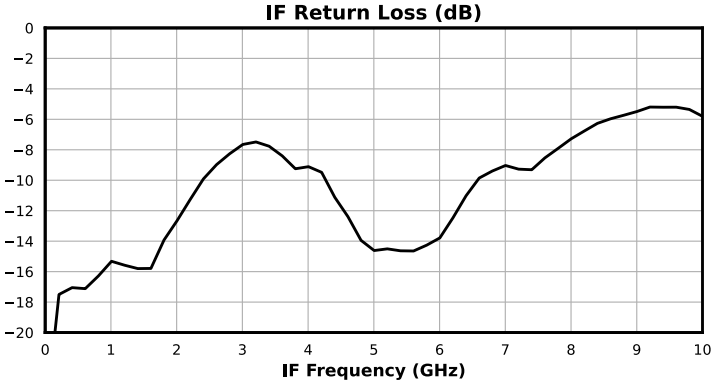
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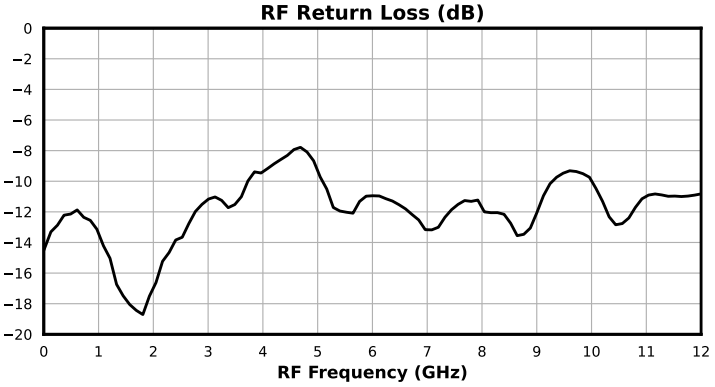
Typical Performance Plots

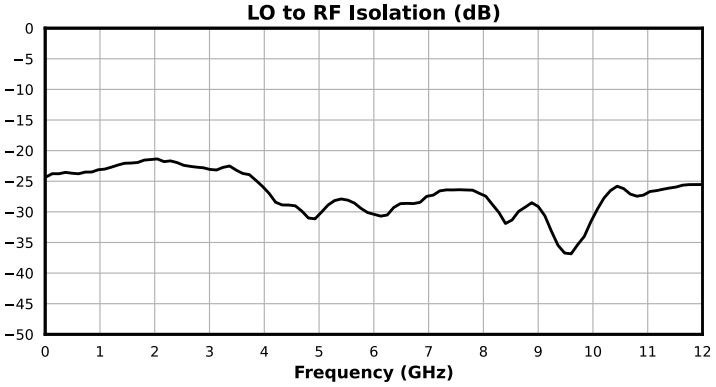


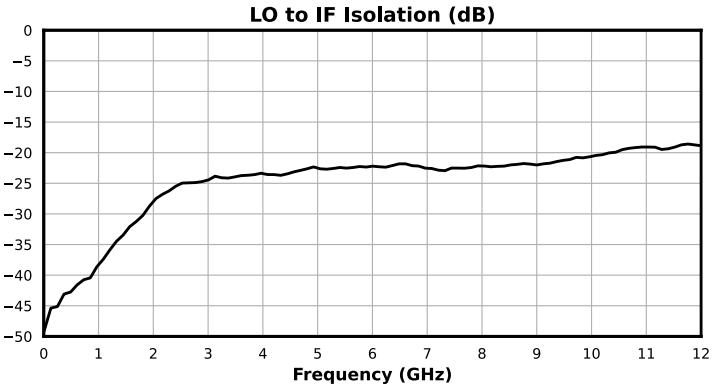


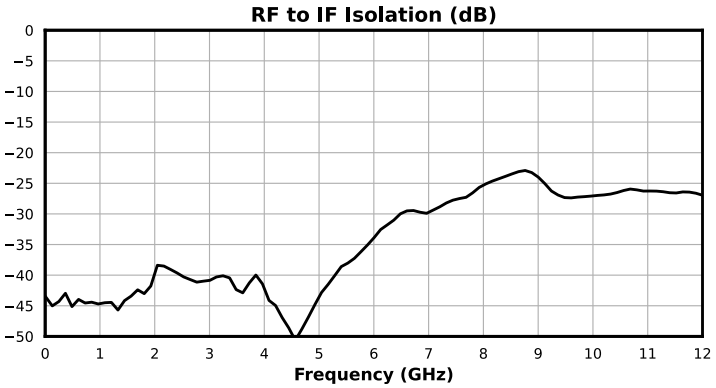






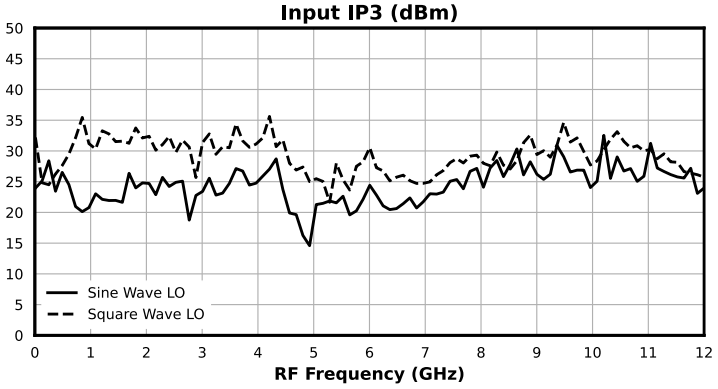




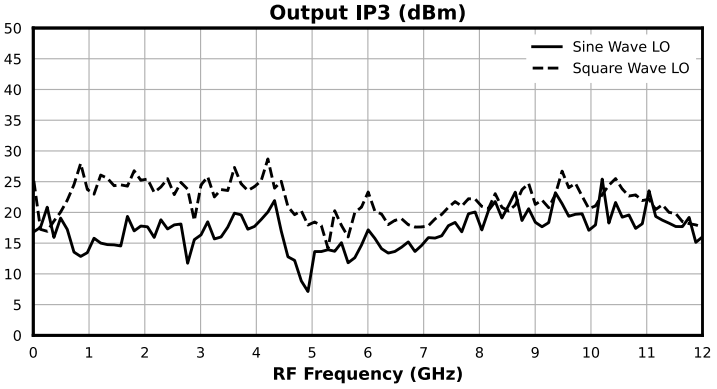


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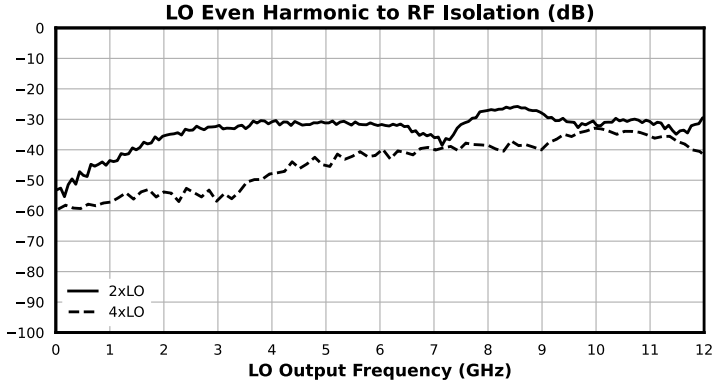
Input IP3 (dBm)



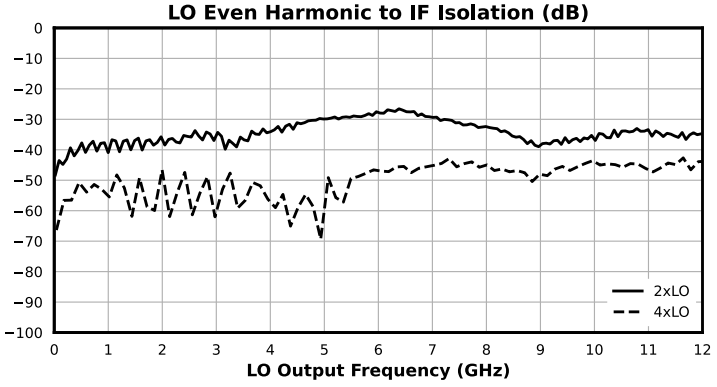
Output IP3 (dBm)



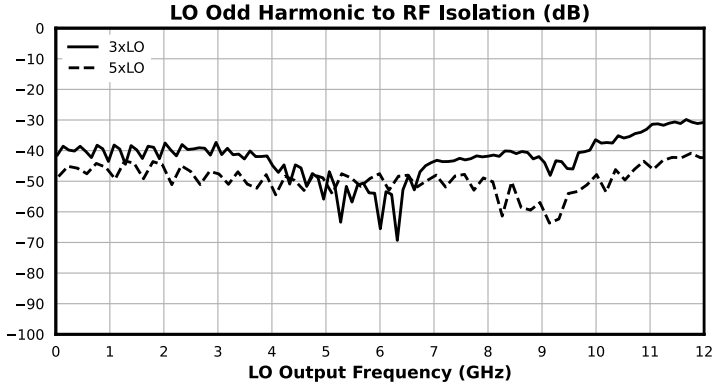
LO Even Harmonic to RF Isolation (dB)



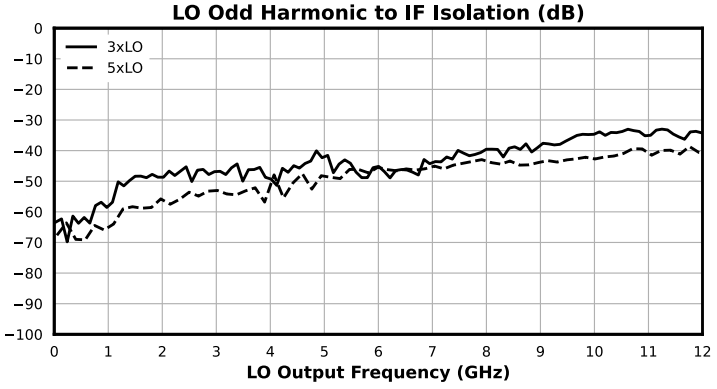
LO Even Harmonic to IF Isolation (dB)



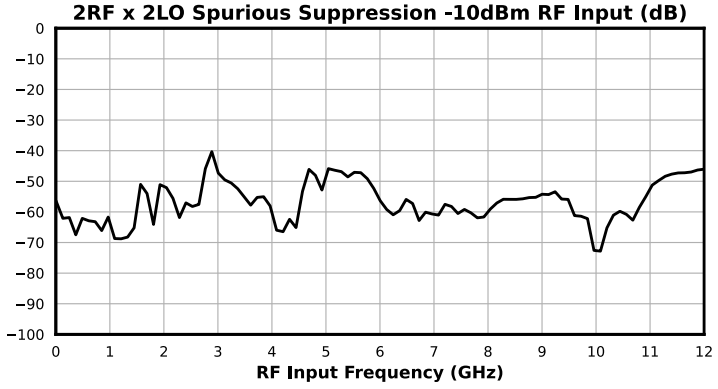
LO Odd Harmonic to RF Isolation (dB)



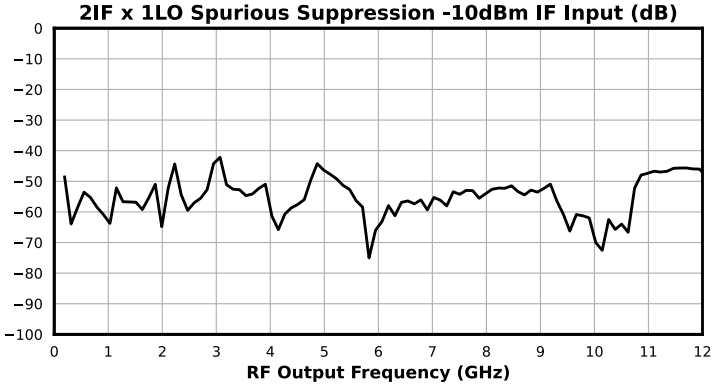
LO Odd Harmonic to IF Isolation (dB)



2RF x 2LO Spurious Suppression -10dBm RF Input (dB)



2IF x 1LO Spurious Suppression -10dBm IF Input (dB)



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Spur Table

Typical Downconversion Spurious Suppression

Spurious data is taken by selecting RF and LO frequencies (+mLO+nRF) within the 10 MHz to 12 GHz RF/LO bands, which create a 100 MHz IF spurious output. The mixer is swept across the full spurious band and the mean is calculated. The numbers shown in the table below are for a -10 dBm RF input. Spurious suppression is scaled for different RF power levels by (n-1), where "n" is the RF spur order. For example, the 2RFx2LO spur is 62 dBc for a -10 dBm input, so a -20 dBm RF input creates a spur that is (2-1) x (-10 dB) dB lower, or 72 dBc.

Typical Downconversion Spurious Suppression (dBc): Sine Wave LO

-10 dBm RF Input	0xLO	1xLO	2xLO	3xLO	4xLO	5xLO
1xRF	-28	Reference	-35	-12	-40	-20
2xRF	-53	-62	-62	-58	-59	-60
3xRF	-82	-93	-94	-87	-90	-84
4xRF	-108	-111	-113	-112	-110	-111
5xRF	-127	-120	-123	-121	-120	-122

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Typical Upconversion Spurious Suppression

Spurious data is taken by mixing a 100 MHz IF with LO frequencies (+mLO+nIF), which creates an RF within the 10 MHz to 12 GHz RF band. The mixer is swept across the full spurious output band and the mean is calculated. The numbers shown in the table below are for a -10 dBm IF input. Spurious suppression is scaled for different IF input power levels by (n-1), where "n" is the IF spur order. For example, the 2IFx1LO spur is typically 63 dBc for a -10 dBm input, so a -20 dBm IF input creates a spur that is (2-1) x (-10 dB) dB lower, or 73 dBc.

Typical Upconversion Spurious Suppression (dBc): Sine Wave LO

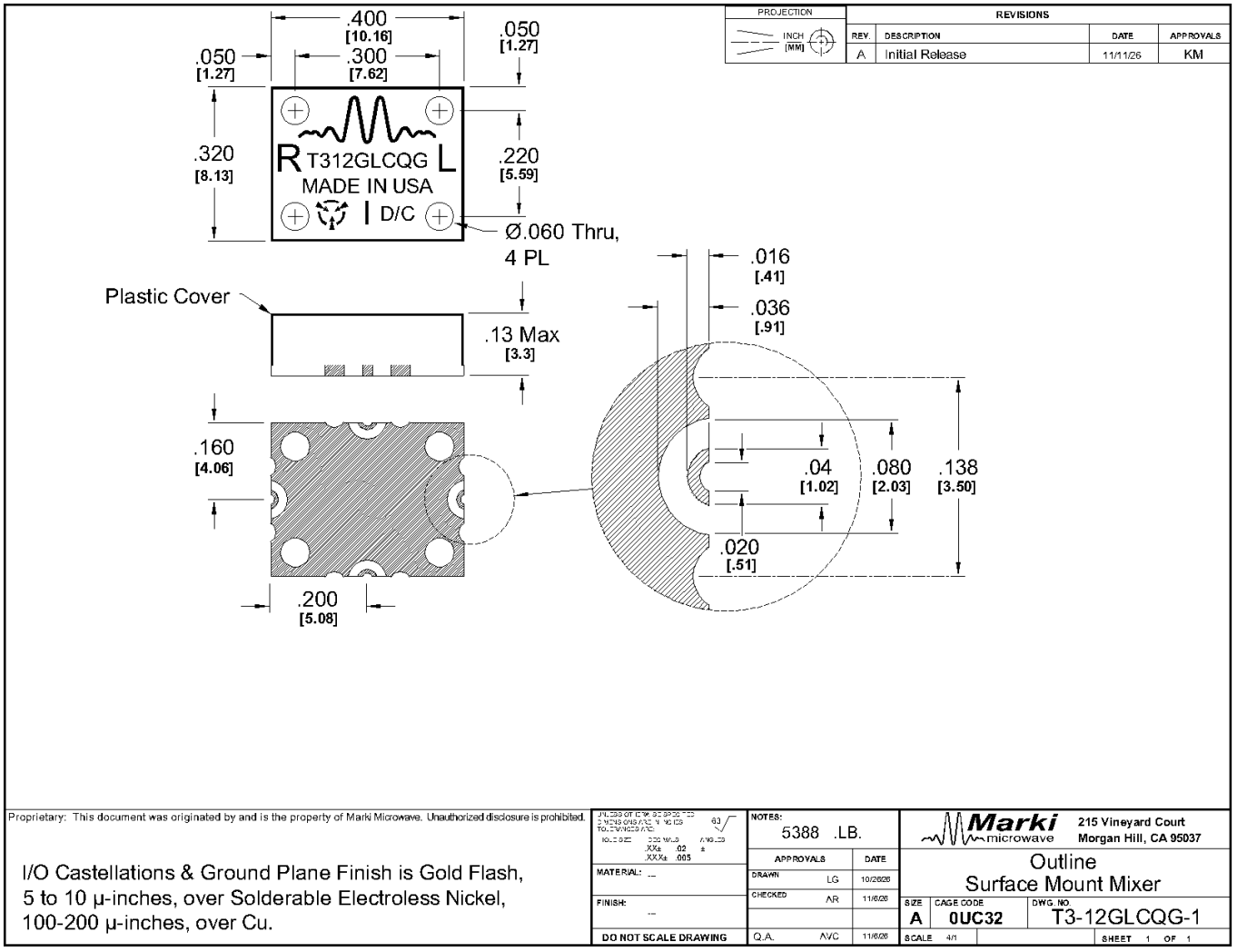
-10 dBm IF Input	0xLO	1xLO	2xLO	3xLO	4xLO	5xLO
1xIF	-29	Reference	-35	-11	-44	-19
2xIF	-69	-63	-65	-68	-66	-65
3xIF	-94	-88	-97	-87	-96	-89
4xIF	-110	-114	-111	-115	-117	-114
5xIF	-127	-125	-129	-126	-127	-126

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Mechanical Data

Outline Drawing

Download : Outline 2D Drawing | Outline 3D Drawing | Outline 3D STP



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Notes

DATA SHEET NOTES:
1. Mixer Conversion Loss Plot IF frequency is 100 MHz.
2. Mixer Noise Figure typically measures within 0.5 dB of conversion loss for IF frequencies greater than 5 MHz.
3. Conversion Loss typically degrades less than 0.5 dB for LO drives 2 dB below the lowest and 3 dB above highest nominal LO drive levels.
4. Conversion Loss typically degrades less than 0.5 dB at +100°C and improves less than 0.5 dB at -55°C.
5. Square Wave Drive created with an A0015, biased at + 6 Volts, with a +10 dBm input. Sine Wave data is taken with a +20 dBm LO input.
6. Specifications are subject to change without notice. Contact Marki Microwave for the most recent specifications and data sheets.
7. Catalog mixer circuits are continually improved. Configuration control requires custom mixer model numbers and specifications.

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