MMIC SURFACE MOUNT

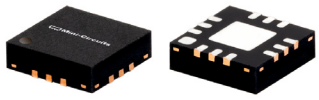
X2 Frequency Multiplier

CY2-283+

50Ω Output 7 to 28 GHz

THE BIG DEAL

- Wideband, output 7 to 28 GHz
- Low conversion loss, 13 dB typ.
- High fundamental & harmonic suppression:
  F1, 34 dBc typ.; F3, 40 dBc typ.; F4, 23 dBc typ.
- Miniature size 3 x 3 x 0.89mm
- Aqueous washable



Generic photo used for illustration purposes only

CASE STYLE: DQ1225

+RoHS Compliant
The +Suffix identifies RoHS Compliance.
See our website for methodologies and qualifications

APPLICATIONS

- Synthesizers
- Local Oscillators
- 5G

PRODUCT OVERVIEW

Mini-Circuits' CY2-283+ is an ultra-wideband MMIC frequency doubler, converting input frequencies from 3.5 to 14 GHz into output frequencies from 7 to 28 GHz. Its wide output range makes this model suitable for broadband systems as well as a wide variety of narrowband applications. Utilizing GaAs HBT technology, the multiplier comes housed in a tiny 3 x 3 x 0.89mm MCLP package and offers excellent repeatability, low inductance, and good thermal efficiency.

KEY FEATURES

Features	Advantages
Broadband, 7 to 28 GHz output	With an output frequency range spanning 7 to 28 GHz, this multiplier supports broadband applications such as defense and instrumentation as well as a wide range of narrowband system requirements including 5G.
Low conversion loss, 13 dB typ.	With a low conversion loss, CY2-283+ produces higher output power, reducing the need for post amplification.
Excellent fundamental and harmonic suppression: • F1, 34 dBc • F3, 40 dBc • F4, 23 dBc	Reduces spurious signals and the need for additional filtering.
Wide input power range, +12 to +18 dBm	Wide input power signal range accommodates different input signal levels while still maintaining a low conversion loss.
3 x 3 mm, 12 lead MCLP package	Low inductance, repeatable transitions, and excellent thermal contact to the PCB
Low cost	Provides an easy, cost-effective solution for generating high-frequency signals from a lower frequency signal source.

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ELECTRICAL SPECIFICATIONS[1] AT 25°C

Parameter		Input Frequency (GHz)	Min.	Typ.	Max.	Unit
Multiplier Factor				2		
Frequency Range, Input (F1)			3.5	—	12	GHz
			12	—	14	
Frequency Range, Output (F2)			7	—	24	GHz
			24	—	28	
Input Power			12	—	18	dBm
Conversion Loss		3.5-12	—	13	17.5	dB
		12-14	—	17	22.5	
Harmonic Output[2]	F1	3.5-12	—	34	—	dBc
		12-14	—	17	—	
	F3	3.5-12	—	40	—	
		12-14	—	47	—	
	F4	3.5-12	—	23	—	

1. At +15 dBm input power measured on Mini-Circuits test board TB-973-CY2283C+
2. Harmonics of input frequency below the power of F2. Harmonics are measured to 50 GHz.

MAXIMUM RATINGS

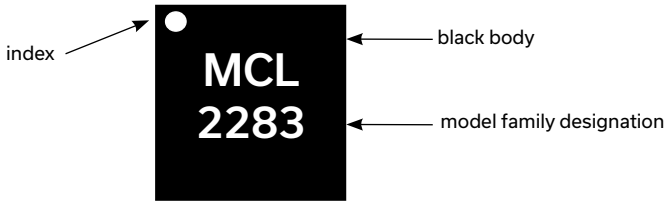
Parameter	Ratings
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
RF Input Power	+21 dBm

Permanent damage may occur if any of these limits are exceeded.

PAD CONNECTIONS

INPUT	5
OUTPUT	11
GROUND	4,6,10,12 & paddle
NO CONNECTIONS	all others

PRODUCT MARKING



Marking may contain other features or characters for internal lot control

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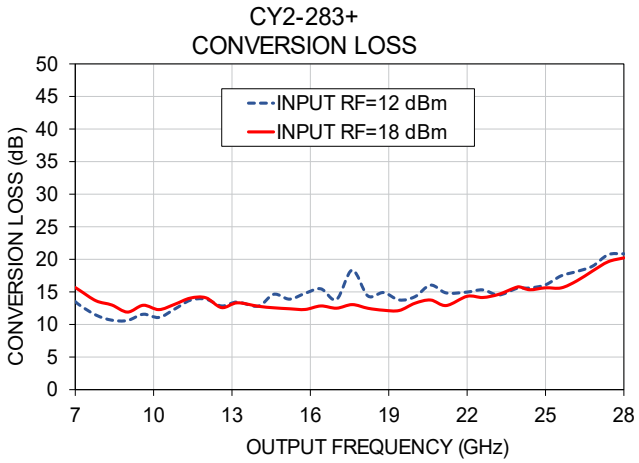
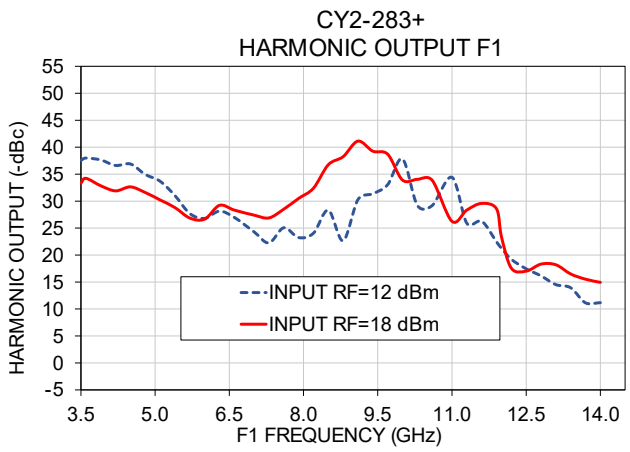
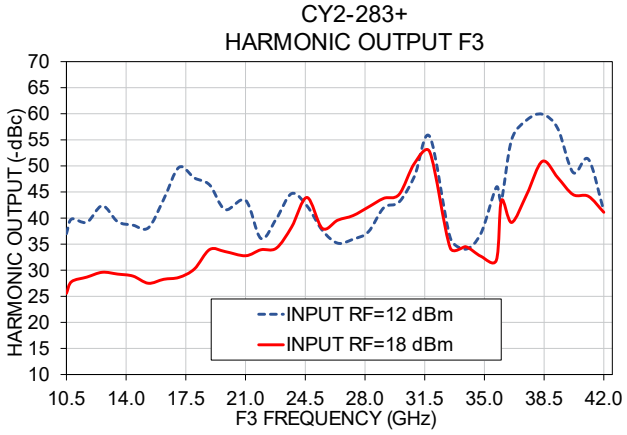
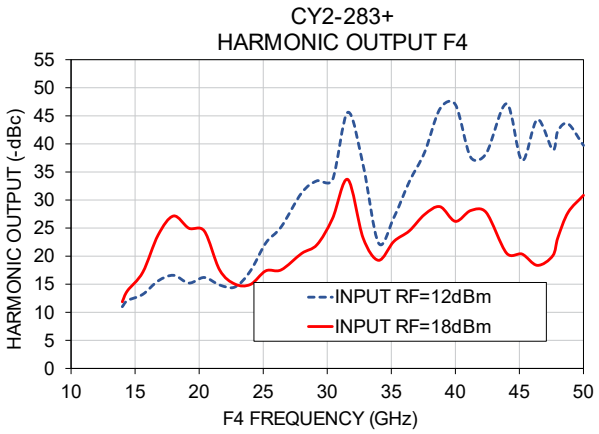
TYPICAL PERFORMANCE DATA

INPUT RF= +12 dBm					INPUT RF= +18 dBm			
Input Frequency (GHz)	Conversion Loss (dB)	Harmonic Output Below F2 (-dBc)			Conversion Loss (dB)	Harmonic Output Below F2 (dBc)		
	F2	F1	F3	F4	F2	F1	F3	F4
3.50	13.52	37.55	37.00	11.00	15.67	33.33	25.55	11.88
4.20	10.66	36.61	42.37	15.60	12.99	31.90	29.61	23.79
5.10	11.09	33.69	38.13	16.20	12.28	30.22	27.50	24.48
6.00	13.89	26.80	47.69	17.37	14.10	26.66	30.24	14.96
6.60	13.45	26.98	41.64	25.21	13.33	28.34	33.58	17.56
7.00	12.82	24.30	43.41	31.27	12.80	27.40	32.78	20.49
7.60	13.89	25.06	39.84	33.55	12.42	28.51	34.22	26.66
8.20	15.48	24.06	42.34	36.21	12.85	32.40	43.95	23.22
9.10	14.39	30.29	35.94	33.25	12.49	41.13	40.48	24.49
10.00	14.26	37.81	43.07	47.00	13.26	33.90	44.53	26.20
11.00	14.98	34.41	36.22	47.14	14.33	26.26	34.26	20.52
12.00	15.62	21.26	43.46	42.31	15.78	23.43	43.37	23.29
13.10	18.14	14.52	57.18	--	16.70	18.20	47.76	--
13.70	20.72	11.14	51.26	--	19.64	15.53	44.17	--
14.00	20.85	11.18	41.38	--	20.23	14.94	41.11	--









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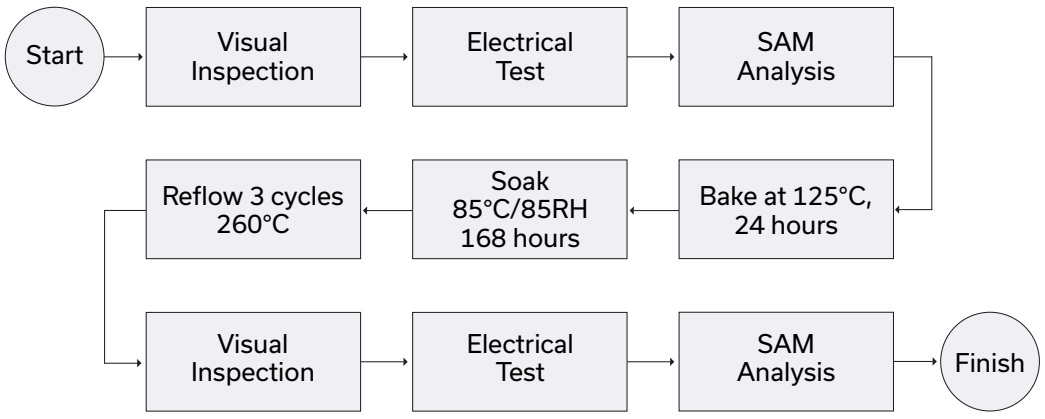
ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASH BOARD. TO ACCESS CLICK HERE

Performance Data	Data Table Swept Graphs S-Parameter (S3P Files) Data Set (.zip file)
Case Style	DQ1225 Plastic package, exposed paddle lead finish: matte-tin
Tape & Reel **Standard quantities available on reel**	F66 7" reels with 20, 50, 100, 200, 500 or 1K devices
Suggested Layout for PCB Design	PL-476
Evaluation Board	TB-851-143+
Environmental Ratings	ENV08T2

ESD RATING

Human body model (HBM): Class 1C (1000 to<2000V) in accordance with ANSI/ESD 5.1-2007

MSL TEST FLOW CHART



NOTES

A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/terms/viewterm.html