Surface Mount

I&Q Modulator

IQBG-2000A+

50Ω LO Drive +10 dBm 1800 to 2000 MHz

Unit may be marked IQBG-2000A+ or IQBG-2000A-4

CASE STYLE: SM20A
PRICE: $24.95 ea. QTY (1-9)

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

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
LO Power	50 mW
I & Q Current	40mA

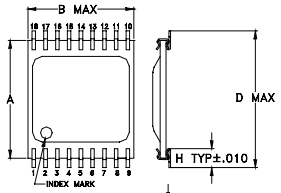
Permanent damage may occur if any of these limits are exceeded.

Pin Connections

LO (carrier)	9
RF (signal)	14
I (0°)(ref.)	10
Q (90°)*	18
GROUND	1,2,3,4,5,6,7,8,11,12,13,15,16,17

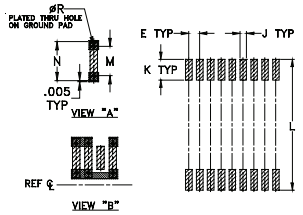
*Q= I +90° for lower sideband suppression

Outline Drawing



Suggested Layout,
Tolerance to be within ±.002
Each ground pin shall have footprint per view "A". All ground pads shall be connected to each other per view "B".

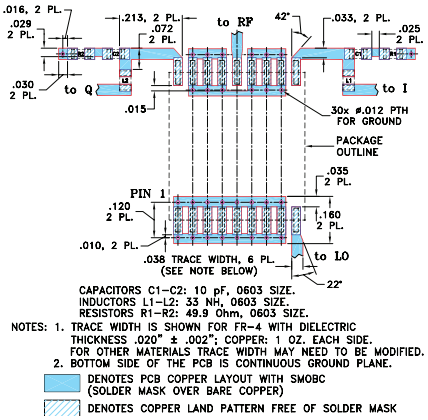
PCB Land Pattern



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	
.500	.460	.095	.575	.050	.015	.025	.070	.030
12.70	11.68	2.41	14.61	1.27	0.38	0.64	1.78	0.76
K	L	M	N	P	Q	R		wt
.095	.600	.120	.160	--	--	.012		grams
2.41	15.24	3.05	4.06	--	--	0.30		1

Demo Board MCL P/N: TB-196
Suggested PCB Layout (PL-222)



CAPACITORS C1–C2: 10 pF, 0603 SIZE.
INDUCTORS L1–L2: 33 NH, 0603 SIZE.
RESISTORS R1–R2: 49.9 Ohm, 0603 SIZE.

NOTES: 1. TRACE WIDTH IS SHOWN FOR FR-4 WITH DIELECTRIC THICKNESS .020" ± .002"; COPPER: 1 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Features

- excellent sideband rejection, 34 dB typ.
- excellent temperature stability
- low noise floor
- low height
- aqueous washable
- protected by US patents, 5,534,830 and 5,745,017

Applications

- communications systems

Modulator Electrical Specifications

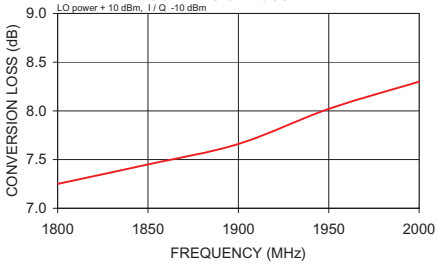
FREQUENCY (MHz) RF (SIGNAL) LO (CARRIER)		I&Q		CONVERSION LOSS (dB)		CARRIER REJECTION (-dBc)		SIDEBAND REJECTION (-dBc)		HARMONIC SUPPRESSION (dBc) 3XI/Q		5XI/Q	
f_L	f_U	Min.	Max.	$\overline{x}$	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ	Min.
1800	2000	DC	10	7.5	9.0	30	20	34	28	50	45	70	50

Typical Performance Data

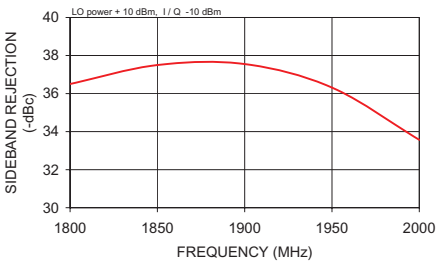
Carrier Frequency (MHz) I/Q = 0.1 MHz	Conversion Loss $\overline{x}$ (dB)	Conversion Loss σ (dB)	Sideband Rejection LSB (-dBc)	Carrier Rejection (-dBc)	3rd. Harmonic Suppression L - 3 I (-dBc)	3rd. Harmonic Suppression L + 3 I (-dBc)
1800	7.25	0.09	36.50	24.72	48.80	78.04
1850	7.45	0.11	37.50	26.41	50.52	73.47
1900	7.66	0.08	37.55	26.47	53.47	76.07
1950	8.02	0.05	36.31	28.23	54.98	69.41
2000	8.30	0.11	33.57	28.80	56.50	72.13

Typical 5th Harmonic Suppression performance: at noise floor, -79 dBc

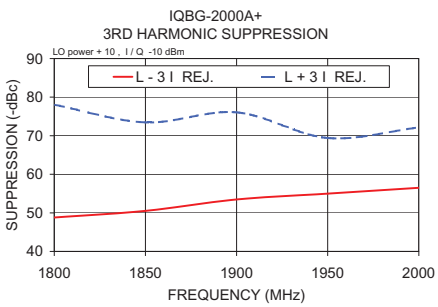
IQBG-2000A+
CONVERSION LOSS



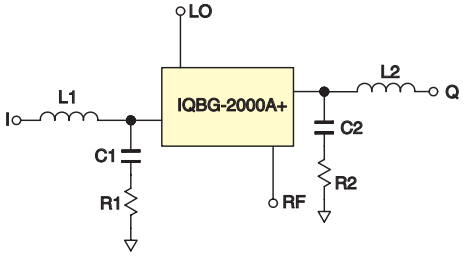
IQBG-2000A+
SIDEBAND REJECTION



IQBG-2000A+
3RD HARMONIC SUPPRESSION



Recommended IF Diplexer



L1, L2 33nH CHIP INDUCTOR (1206)
C1, C2 10pF NPO CHIP CAPACITOR (0603)
R1, R2 47Ω 5% CHIP RESISTOR (0603)

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.
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