

# MODULATORS

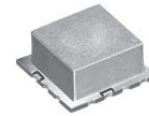
## I & Q

### LEADLESS SURFACE-MOUNT



CARRIER FREQUENCY (MHz)	MODULATION FREQUENCY (MHz)	CARRIER POWER (dBm) NOM	CONVERSION LOSS (dB) MAX	SSB REJECTION (dB) MIN	LO/RF ISOLATION (dB) MIN	INPUT 1 dB COMP. PT. (dBm) MIN	INPUT IP <sub>3</sub> (dBm) TYP	PACKAGE	PIN-OUT (See Below)	MODEL
28.5 - 31.5	DC-15	+10	8.0	30	45	0	+15	102S	1	SMS-201
57 - 63	DC-30	+10	8.0	30	45	0	+15	102S	1	SMS-202
66.5 - 73.5	DC-35	+10	8.0	30	45	0	+15	102S	1	SMS-203
40 - 80	DC-40	+10	8.0	30	45	0	+15	102S	1	SMS-204
80 - 160	DC-80	+10	8.0	30	45	0	+15	102S	1	SMS-205
100 - 200	DC-100	+10	8.0	30	45	0	+15	102S	1	SMS-206
150 - 165	DC-20	+26	8.0	25	65	+20	+30	103S	1	SMS-1506
165	DC-5.0	+17	8.0	25	65	+8.0	+20	103S	1	SMS-1650
220	DC-10	+13	8.0	25	60	+6.0	+18	103S	1	SMS-2206
810 - 830	DC-40	+10	8.5	30	35	0	+15	102S	1	SMS-214
869 - 894	DC-80	+10	8.5	30	35	0	+15	102S	1	SMS-224
935 - 960	DC-100	+10	8.5	30	35	0	+15	102S	1	SMS-234
1805 - 1880	DC-100	+10	8.5	25	25	0	+15	102S	1	SMS-244

### MINIATURE SURFACE-MOUNT PACKAGE



CARRIER FREQUENCY (MHz)	MODULATION FREQUENCY (MHz)	CARRIER POWER (dBm) NOM	CONVERSION LOSS (dB) MAX	SSB REJECTION (dB) MIN	LO/RF ISOLATION (dB) MIN	INPUT 1 dB COMP. PT. (dBm) MIN	INPUT IP <sub>3</sub> (dBm) TYP	PACKAGE	PIN-OUT (See Below)	MODEL
935-960	DC-10	+10	8.5	25	45	0	+15	240	2	VMS-935M
1710-1780	DC-10	+10	8.5	23	43	0	+15	240	2	VMS-1710M

#### Notes:

- SSB rejection based on optimum input quadrature signals.
- Conversion Loss is the difference between total power of both modulation inputs, and desired sideband output.
- USB is suppressed when MOD.1 is +90° ref to MOD.2.
- LSB is suppressed when MOD.1 is -90° ref to MOD.2.
- Nominal impedance = 50 ohms.
- Maximum RF input power without damage 200 mW.

#### PIN-OUT TABLE

	CARRIER	OUTPUT	MOD <sub>1</sub>	MOD <sub>2</sub>	CASE GND
#1	8	1	3	4	All Other
#2	1	8	11	5	All Other

For pin location and package outline drawings, see back pages.

# MODULATORS

## I & Q

### THROUGH HOLE MODELS

#### 8 PIN - RELAY HEADER



CARRIER FREQUENCY (MHz)	MODULATION FREQUENCY (MHz)	CARRIER POWER (dBm) NOM	CONVERSION LOSS (dB) MAX	SSB REJECTION (dB) MIN	LO/RF ISOLATION (dB) MIN	INPUT 1 dB COMP. PT. (dBm) MIN	INPUT IP <sub>3</sub> (dBm) TYP	PACKAGE	PIN-OUT (See Below)	MODEL
28.5 - 31.5	DC-15	+10	8.0	30	45	0	+15	102	1	SMR-201
40 - 80	DC-40	+10	8.0	30	45	0	+15	102	1	SMR-204
57 - 63	DC-30	+10	8.0	30	45	0	+15	102	1	SMR-202
60 - 120	DC-60	+10	8.0	30	45	0	+15	102	1	SMR-212
66.5 - 73.5	DC-35	+10	8.0	30	45	0	+15	102	1	SMR-203
80 - 160	DC-80	+10	8.0	30	45	0	+15	102	1	SMR-205
100 - 200	DC-100	+10	8.0	30	45	0	+15	102	1	SMR-206
810 - 830	DC-40	+10	8.5	30	35	0	+15	102	1	SMR-214
869 - 894	DC-80	+10	8.5	30	35	0	+15	102	1	SMR-224
935 - 960	DC-100	+10	8.5	30	35	0	+15	102	1	SMR-234
1805 - 1880	DC-100	+10	8.5	25	25	0	+15	102	1	SMR-244

#### PLUG-IN (6 PIN (WIDEBAND) AND 16 PIN)



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CARRIER FREQUENCY (MHz)	MODULATION FREQUENCY (MHz)	CARRIER POWER (dBm) NOM	CONVERSION LOSS (dB) MAX	SSB REJECTION (dB) MIN	LO/RF ISOLATION (dB) MIN	INPUT 1 dB COMP. PT. (dBm) MIN	INPUT IP <sub>3</sub> (dBm) TYP	PACKAGE	PIN-OUT (See Below)	MODEL
15 - 510	DC-250	+10	9.0	15	35	0	+15	151	3	SMP-34-15
28.5 - 31.5	DC-15	+10	8.0	30	45	0	+15	124	2	SMP-901
57 - 63	DC-30	+10	8.0	30	45	0	+15	124	2	SMP-902
66.5 - 73.5	DC-35	+10	8.0	30	45	0	+15	124	2	SMP-903
40 - 80	DC-40	+10	8.0	30	45	0	+15	124	2	SMP-904
80 - 160	DC-80	+10	8.0	30	45	0	+15	124	2	SMP-905
100 - 200	DC-100	+10	8.0	30	45	0	+15	124	2	SMP-906
275 - 550	DC-10	+10	8.5	15	35	0	+15	124	2	SMP-907
810 - 830	DC-40	+10	8.5	30	35	0	+15	124	2	SMP-914
869 - 894	DC-80	+10	8.5	30	35	0	+15	124	2	SMP-924
935 - 960	DC-100	+10	8.5	30	35	0	+15	124	2	SMP-934
1805 - 1880	DC-100	+10	8.5	25	25	0	+15	124	2	SMP-944

Notes:

- SSB rejection based on optimum input quadrature signals.
- Conversion Loss is the difference between total power of both modulation inputs, and desired sideband output.
- USB is suppressed when MOD.1 is +90° ref to MOD.2.
- LSB is suppressed when MOD.1 is -90° ref to MOD.2.
- Nominal impedance = 50 ohms.
- Maximum RF input power without damage 200 mW.

PIN-OUT TABLE

	CARRIER	OUTPUT	MOD <sub>1</sub>	MOD <sub>2</sub>	CASE GND
#1	8	1	3	4	All other
#2	16	1	4	13	All other
#3	6	1	3	2	4,5

For pin location and package outline drawings, see back pages.

# MODULATORS I & Q



## FLAT PACK MODELS

CARRIER FREQUENCY (MHz)	MODULATION FREQUENCY (MHz)	CARRIER POWER (dBm) NOM	CONVERSION LOSS (dB) MAX	SSB REJECTION (dB) MIN	LO/RF ISOLATION (dB) MIN	INPUT 1 dB COMP. PT. (dBm) MIN	INPUT IP <sub>3</sub> (dBm) TYP	PACKAGE	PIN-OUT (See Below)	MODEL
28.5 - 31.5	DC-15	+10	8.0	30	45	0	+15	115	1	<b>SMF-201</b>
57 - 63	DC-30	+10	8.0	30	45	0	+15	115	1	<b>SMF-202</b>
66.5 - 73.5	DC-35	+10	8.0	30	45	0	+15	115	1	<b>SMF-203</b>
40 - 80	DC-40	+10	8.0	30	45	0	+15	115	1	<b>SMF-204</b>
80 - 160	DC-80	+10	8.0	30	45	0	+15	115	1	<b>SMF-205</b>
100 - 200	DC-100	+10	8.0	30	45	0	+15	115	1	<b>SMF-206</b>

## COAXIAL (SMA) CONNECTOR MODELS



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CARRIER FREQUENCY (MHz)	MODULATION FREQUENCY (MHz)	CARRIER POWER (dBm) NOM	CONVERSION LOSS (dB) MAX	SSB REJECTION (dB) MIN	LO/RF ISOLATION (dB) MIN	INPUT 1 dB COMP. PT. (dBm) MIN	INPUT IP <sub>3</sub> (dBm) TYP	PACKAGE	PIN-OUT (See Below)	MODEL
15 - 510	DC-250	+10	9.0	15	35	0	+15	153	2	<b>SMK-34-15</b>
28.5 - 31.5	DC-15	+10	8.0	30	45	0	+15	113	2	<b>SMK-701*</b>
57 - 63	DC-30	+10	8.0	30	45	0	+15	113	2	<b>SMK-702*</b>
66.5 - 73.5	DC-35	+10	8.0	30	45	0	+15	113	2	<b>SMK-703*</b>
40 - 80	DC-40	+10	8.0	30	45	0	+15	113	2	<b>SMK-704*</b>
80 - 160	DC-80	+10	8.0	30	45	0	+15	113	2	<b>SMK-705*</b>
100 - 200	DC-100	+10	8.0	30	45	0	+15	113	2	<b>SMK-706*</b>

\*Select female connector suffix: S=SMA, B=BNC, N=Type N, T=TNC.  
All other models numbers are available with SMA connectors only.

### Notes:

- SSB rejection based on optimum input quadrature signals.
- Conversion Loss is the difference between total power of both modulation inputs, and desired sideband output.
- USB is suppressed when MOD.1 is +90° ref to MOD.2.
- LSB is suppressed when MOD.1 is -90° ref to MOD.2.
- Nominal impedance = 50 ohms.
- Maximum RF input power without damage 200 mW.

### PIN-OUT TABLE

	CARRIER	OUTPUT	MOD <sub>1</sub>	MOD <sub>2</sub>	CASE GND
#1	1	14	10	5	All Other
#2	1	3	2	4	-

For pin location and package outline drawings, see back pages.