

# MODULATORS

# QPSK



113



153

## COAXIAL CONNECTOR MODELS

INPUT CARRIER FREQUENCY (MHz)	INSERTION LOSS (dB) MAX	AMPLITUDE UNBALANCE (dB) MAX	PHASE UNBALANCE (Degrees)		INPUT 1 dB COMP. PT. (dBm) MIN	VSWR MAX	PACKAGE	PIN-OUT (See Below)	MODEL
			Fc MAX	FULL BAND MAX					
15 - 510	11.0	1.5	10	10	+4	2.5:1	153	1	MK-34-15
28.5 - 31.5	7.0	0.4	2.0	3.5	+4	1.7:1	113	1	MK-751*
52 - 88	8.0	1.0	2.0	5.0	+4	1.7:1	113	1	MK-757*
57 - 63	7.0	0.4	2.0	3.5	+4	1.7:1	113	1	MK-753*
66.5 - 73.5	7.0	0.4	2.0	3.5	+4	1.7:1	113	1	MK-755*
104 - 176	8.0	1.0	2.0	5.0	+4	1.7:1	113	1	MK-758*
133 - 147	7.0	0.4	2.0	3.5	+4	1.7:1	113	1	MK-756*
190 - 210	7.0	0.4	2.0	3.5	+4	1.7:1	113	1	MK-759*
285 - 315	7.5	0.4	2.0	5.0	+4	1.7:1	113	1	MK-760*
810 - 830	8.0	0.6	4.0	5.0	+4	2.0:1	113	1	MK-714S
869 - 894	8.5	0.6	4.0	5.0	+4	2.0:1	113	1	MK-724S
935 - 960	8.0	0.6	4.0	5.0	+4	2.0:1	113	1	MK-734S
1805 - 1880	9.5	1.0	6.0	7.0	+4	2.2:1	113	1	MK-736S

**Notes:**

Logic 1 corresponds to +20 mA and Logic 0 corresponds to -20 mA.

Requires external bipolar squarewave driver capable of generating +/-20 mA to drive D1 and D3.

Nominal input/output impedance = 50 ohms.

Maximum RF input power without damage 200 mW and 40 mA at D1 and D3.

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

**PIN-OUT TABLE**

	CARRIER	OUTPUT	D1	D3
#1	1	3	2	4

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

**LOGIC TABLE**

PHASE	D1	D3
0°	1	1
90°	1	0
180°	0	0
270°	0	1

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## SURFACE-MOUNT MODELS

INPUT CARRIER FREQUENCY (MHz)	INSERTION LOSS (dB) MAX	AMPLITUDE UNBALANCE (dB) MAX	PHASE UNBALANCE (Degrees)		INPUT 1 dB COMP. PT. (dBm) MIN	VSWR MAX	PACKAGE	PIN-OUT (See Below)	MODEL
			Fc MAX	FULL BAND MAX					
10.165 - 11.235	7.0	0.4	2.0	3.5	+4	1.7:1	102S	1	<b>MS-202</b>
20.33 - 22.47	7.0	0.4	2.0	3.5	+4	1.7:1	102S	1	<b>MS-204</b>
28.5 - 31.5	7.0	0.4	2.0	3.5	+4	1.7:1	102S	1	<b>MS-201</b>
52 - 88	8.0	1.0	2.0	5.0	+4	1.7:1	102S	1	<b>MS-207</b>
57 - 63	7.0	0.4	2.0	3.5	+4	1.7:1	102S	1	<b>MS-203</b>
66.5 - 73.5	7.0	0.4	2.0	3.5	+4	1.7:1	102S	1	<b>MS-205</b>
104 - 176	8.0	1.0	2.0	5.0	+4	1.7:1	102S	1	<b>MS-208</b>
133 - 147	7.0	0.4	2.0	3.5	+4	1.7:1	102S	1	<b>MS-206</b>
190 - 210	7.0	0.4	2.0	3.5	+4	1.7:1	102S	1	<b>MS-209</b>
285 - 315	7.5	0.4	2.0	5.0	+4	1.7:1	102S	1	<b>MS-210</b>
810 - 830	8.0	0.6	4.0	5.0	+4	2.0:1	102S	1	<b>MS-214</b>
869 - 894	8.5	0.6	4.0	5.0	+4	2.0:1	102S	1	<b>MS-224</b>
935 - 960	8.0	0.6	4.0	5.0	+4	2.0:1	102S	1	<b>MS-234</b>
1805 - 1880	9.5	1.0	6.0	7.0	+4	2.2:1	102S	1	<b>MS-236</b>



## FLAT PACK MODELS

INPUT CARRIER FREQUENCY (MHz)	INSERTION LOSS (dB) MAX	AMPLITUDE UNBALANCE (dB) MAX	PHASE UNBALANCE (Degrees)		INPUT 1 dB COMP. PT. (dBm) MIN	VSWR MAX	PACKAGE	PIN-OUT (See Below)	MODEL
			Fc MAX	FULL BAND MAX					
28.5 - 31.5	7.0	0.4	2.0	3.5	+4	1.7:1	115	2	<b>MF-111</b>
52 - 88	8.0	1.0	2.0	5.0	+4	1.7:1	115	2	<b>MF-117</b>
57 - 63	7.0	0.4	2.0	3.5	+4	1.7:1	115	2	<b>MF-113</b>
66.5 - 73.5	7.0	0.4	2.0	3.5	+4	1.7:1	115	2	<b>MF-115</b>
104 - 176	8.0	1.0	2.0	5.0	+4	1.7:1	115	2	<b>MF-118</b>
133 - 147	7.0	0.4	2.0	3.5	+4	1.7:1	115	2	<b>MF-116</b>
190 - 210	7.0	0.4	2.0	3.5	+4	1.7:1	115	2	<b>MF-119</b>
285 - 315	7.5	0.4	2.0	5.0	+4	1.7:1	115	2	<b>MF-120</b>

Notes:  
 Logic 1 corresponds to +20 mA and Logic 0 corresponds to -20 mA.  
 Above models do not include Logic complimentary drivers.  
 Nominal input/output impedance = 50 ohms.  
 Maximum RF input power without damage 200 mW and 40 mA.

PIN-OUT TABLE

	CARRIER	OUTPUT	D1	D2	D3	D4	CASE GND
#1	8	1	3	5	4	62,7	
#2	1	14	5	3	12	10	All Other

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

LOGIC TABLE

PHASE	D1	D2	D3	D4
0°	1	0	1	0
90°	1	0	0	1
180°	0	1	0	1
270°	0	1	1	0

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### THROUGH-HOLE

### 8 PIN - RELAY CAN



INPUT CARRIER FREQUENCY (MHz)	INSERTION LOSS (dB) MAX	AMPLITUDE UNBALANCE (dB) MAX	PHASE UNBALANCE (Degrees)		INPUT 1 dB COMP. PT. (dBm) MIN	VSWR MAX	PACKAGE	PIN-OUT (See Below)	MODEL
			Fc MAX	FULL BAND MAX					
10.165 - 11.235	7.0	0.4	2.0	3.5	+4	1.7:1	102	1	MR-202
20.33 - 22.47	7.0	0.4	2.0	3.5	+4	1.7:1	102	1	MR-204
28.5 - 31.5	7.0	0.4	2.0	3.5	+4	1.7:1	102	1	MR-201
52 - 88	8.0	1.0	2.0	5.0	+4	1.7:1	102	1	MR-207
57 - 63	7.0	0.4	2.0	3.5	+4	1.7:1	102	1	MR-203
66.5 - 73.5	7.0	0.4	2.0	3.5	+4	1.7:1	102	1	MR-205
104 - 176	8.0	1.0	2.0	5.0	+4	1.7:1	102	1	MR-208
133 - 147	7.0	0.4	2.0	3.5	+4	1.7:1	102	1	MR-206
190 - 210	7.0	0.4	2.0	3.5	+4	1.7:1	102	1	MR-209
285 - 315	7.5	0.4	2.0	5.0	+4	1.7:1	102	1	MR-210
810 - 830	8.0	0.6	4.0	5.0	+4	2.0:1	102	1	MR-214
869 - 894	8.5	0.6	4.0	5.0	+4	2.0:1	102	1	MR-224
935 - 960	8.0	0.6	4.0	5.0	+4	2.0:1	102	1	MR-234
1805 - 1880	9.5	1.0	6.0	7.0	+4	2.2:1	102	1	MR-236

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



INPUT CARRIER FREQUENCY (MHz)	INSERTION LOSS (dB) MAX	AMPLITUDE UNBALANCE (dB) MAX	PHASE UNBALANCE (Degrees)		INPUT 1 dB COMP. PT. (dBm) MIN	VSWR MAX	PACKAGE	PIN-OUT (See Below)	MODEL
			Fc MAX	FULL BAND MAX					
15 - 510	11.0	1.5	10	10	+4	2.5:1	151	3	*MP-34-15
28.5 - 31.5	7.0	0.4	2.0	3.5	+4	1.7:1	124	2	MP-901
52 - 88	8.0	1.0	2.0	5.0	+4	1.7:1	124	2	MP-907
57 - 63	7.0	0.4	2.0	3.5	+4	1.7:1	124	2	MP-903
66.5 - 73.5	7.0	0.4	2.0	3.5	+4	1.7:1	124	2	MP-905
104 - 176	8.0	1.0	2.0	5.0	+4	1.7:1	124	2	MP-908
133 - 147	7.0	0.4	2.0	3.5	+4	1.7:1	124	2	MP-906
190 - 210	7.0	0.4	2.0	3.5	+4	1.7:1	124	2	MP-909
285 - 315	7.5	0.4	2.0	5.0	+4	1.7:1	124	2	MP-910
810 - 830	8.0	0.6	4.0	5.0	+4	2.0:1	124	2	MP-914
869 - 894	8.5	0.6	4.0	5.0	+4	2.0:1	124	2	MP-924
935 - 960	8.0	0.6	4.0	5.0	+4	2.0:1	124	2	MP-934
1805 - 1880	9.5	1.0	6.0	7.0	+4	2.2:1	124	2	MP-936

Notes:  
 Logic 1 corresponds to +20 mA and Logic 0 corresponds to -20 mA.  
 Above models do not include Logic complimentary drivers.  
 Nominal input/output impedance = 50 ohms.  
 Maximum RF input power without damage 200 mW and 40 mA.  
 The logic table for the MP-34-15 is the same as for the coaxial connector models.

PHASE	D1	D2	D3	D4
0°	1	0	1	0
90°	1	0	0	1
180°	0	1	0	1
270°	0	1	1	0

PIN-OUT TABLE

	CARRIER	OUTPUT	D1	D2	D3	D4	CASE GND
#1	8	1	3	5	4	6	2,7
#2	16	1	13	5	3	4	All Other
#3	6	1	3	-	2	-	4,5

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