SPDT RF SWITCH

50Ω DC-3000 MHz

Absorptive RF Switch with internal driver. Single Supply Voltage

ZX80-DR230+

Product Features

- Low Insertion loss over entire frequency range
- Super High Isolation over entire frequency range
- High Input IP3, +55 dBm typ.
- Single positive supply voltage, +2.7V to +5V
- Unique design-simultaneous switch off of RF1&RF2
- Rigid unibody case

Typical Applications

- Lab
- Instrumentation
- Test equipment

CASE STYLE: HL1162

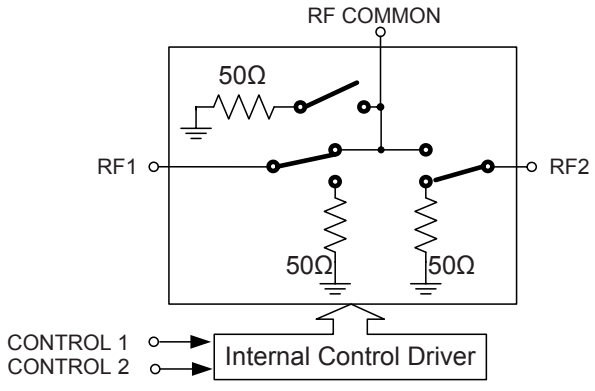
Connectors	Order P/N	Price	Qty.
SMA	ZX80-DR230-S+	$59.95 ea.	(1-9)

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

General Description

The ZX80-DR230+ is a 50Ω high isolation SPDT RF switch designed for wireless applications, covering a broad frequency range from DC up to 3GHz with low insertion loss. The ZX80-DR230+ operates on a single supply voltage from +2.7V to +5V. This unit includes an internal CMOS control driver with two-pins control. The ZX80-DR230+ is produced using a unique case package for ruggedness and operation in tough environments.

Functional Diagram



Parameter	Condition	Min.	Typ.	Max.	Units
Operating Frequency		DC (note 3)		3000	MHz
Insertion Loss	1 GHz 2 GHz 3 GHz		0.7 0.9 1.2	1.3 1.6 1.8	dB
Isolation between Common port and RF1/RF2 ports	1 GHz 2 GHz 3 GHz	55 46 35	64 50 44		dB
Isolation between RF1 and RF2 ports	1 GHz 2 GHz 3 GHz	60 54 37	63 60 48		dB
Return Loss @ Common port	1 GHz 2 GHz 3 GHz		20 17 15		dB
Return Loss @ RF1/RF2 ports	1 GHz 2 GHz 3 GHz		17 15 15		dB
Input IP2 (note 1)	5 MHz - 1000 MHz		+80		dBm
Input IP3 (note 1)	10 MHz - 3000MHz		+55		dBm
Input 1dB Compression (note 1,2)	1000 MHz	+28	+31		dBm

Notes:
1. Device linearity degrades below 1 MHz.
2. Note absolute maximum ratings for input power.
3. Lowest Freq. determined by value of coupling capacitors at RF ports.

DC Electrical Specifications

Parameter	Min.	Typ.	Max.	Units
V_{DD}, Supply Voltage	2.7	-	5.0	V
Supply Current (V_{DD} = 5V)	—	0.5	1.0	mA
Control Voltage Low	0	—	0.4	V
Control Voltage High	2.4	—	V_{DD}	V
Control Current (per pin)	—	0.5	1.0	mA

Switching Specifications

Parameter	Min.	Typ.	Max.	Units
Switching Time, 50% CTRL to 90/10% RF	—	2.0	—	μSec
Video Feedthrough, 5 MHz - 1000 MHz (note 4)	—	—	15	mV_{p-p}

Note 4: Measured with a 1 nSec risetime,0/3V pulse and 500 MHz bandwidth.

Absolute Maximum Ratings

Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
V_{DD}, Supply Voltage	-0.3V Min. 6V Max.
Control Voltage	-0.3V Min. 6V Max.
ESD, HBM	1000V
RF input power: (note 5) When the common port is connected to the RF port (RF1 or RF2) When the RF port (RF1 or RF2) is not connected to the common port When the common port is not connected to either RF1 or RF2	 +33dBm +24dBm +24dBm

Note 5: See Truth Table on page 3.

The RF switch control bits select the desired switch-state, as shown in **Table 1**: Truth Table.

Table 1: Truth Table.

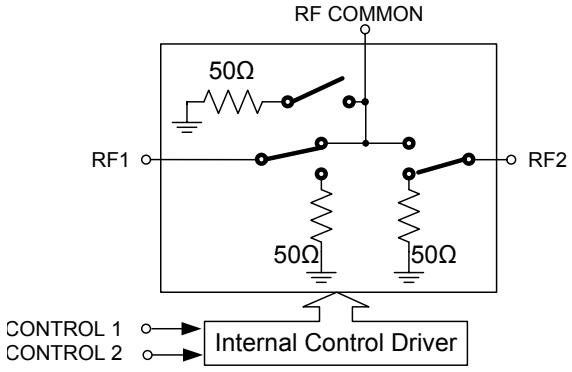
STATE	Control Input		RF Input / Output	
	Control 1	Control 2	RF1 to RF COMMON	RF2 to RF COMMON
1	Low	Low	OFF	OFF
2	Low	High	OFF	ON
3	High	Low	ON	OFF
4	High	High	N/A	N/A

General notes:

1. When either of the RF1 or RF2 ports is closed (**ON** state), the closed port is connected to the RF Common port.
2. When either of the RF1 or RF2 ports is open (**OFF** state), the open port is connected to an internal 50Ω termination.
3. When both RF1 and RF2 ports are open (**OFF** state), the all three RF ports are connected to an internal 50Ω termination.

EXAMPLE OF STATE 3

Functional Diagram

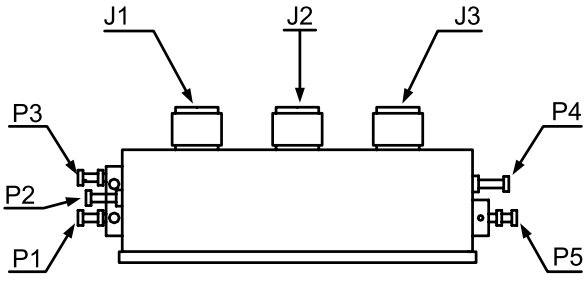


Pin Description

Function	Connection Number	Description	
RF2	J1	RF I/O	(note 1)
RF COM	J2	RF Common	(note 1)
RF1	J3	RF I/O	(note 1)
Control 1	P1	Control 1	
GND	P2	Ground	
Control 2	P3	Control 2	
GND	P4	Ground	
VDD	P5	Supply voltage	

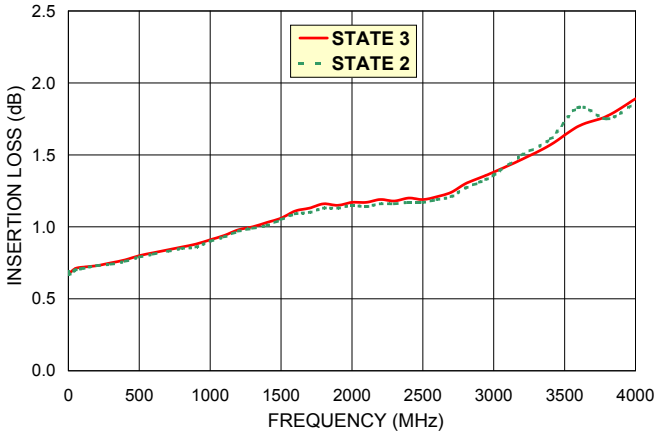
Note 1: RF ports J1, J2 and J3 must be at 0 VDC. The RF ports do not require DC blocking capacitors for proper operation if the 0 VDC requirement is met.

Pin Configuration

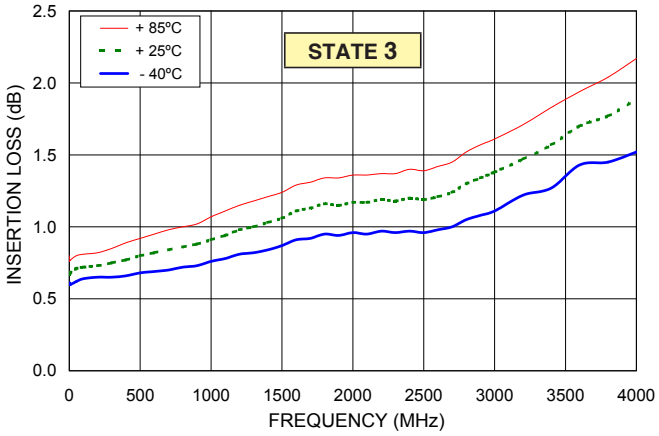


Typical Performance Curves over various states. For switch state see Truth Table 1 on page 3.

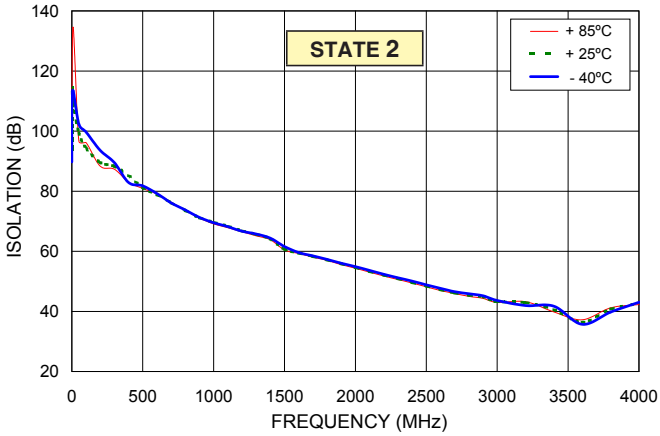
INSERTION LOSS Vs. FREQUENCY @ +25°C



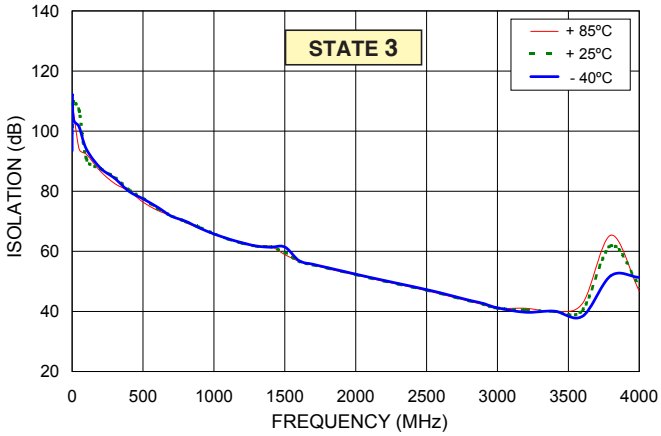
INSERTION LOSS Vs. FREQUENCY



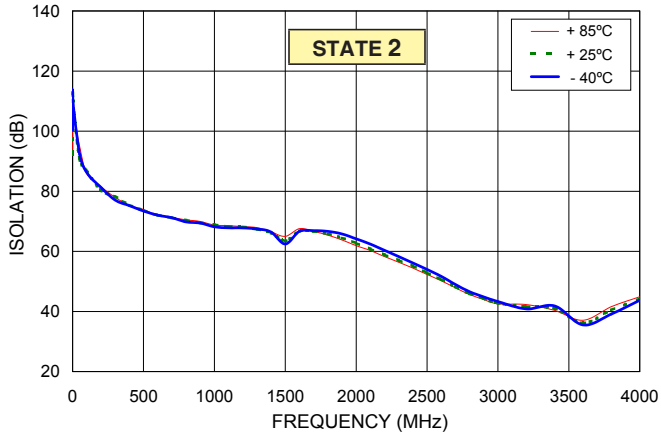
ISOLATION BETWEEN RF1 TO RF COM Vs. FREQUENCY



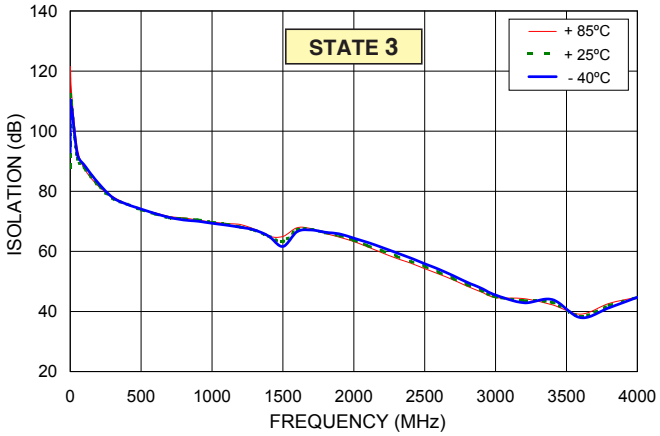
ISOLATION BETWEEN RF2 TO RF COM Vs. FREQUENCY



ISOLATION BETWEEN RF1 TO RF2 Vs. FREQUENCY



ISOLATION BETWEEN RF1 TO RF2 Vs. FREQUENCY



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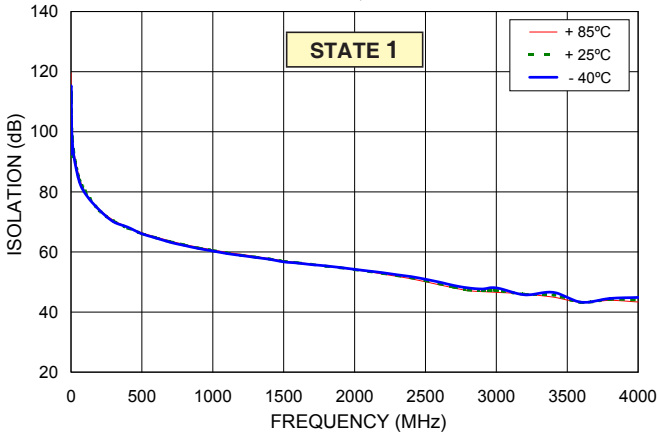
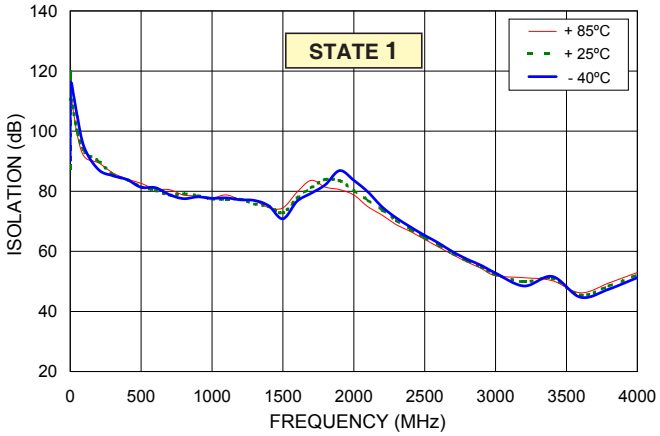
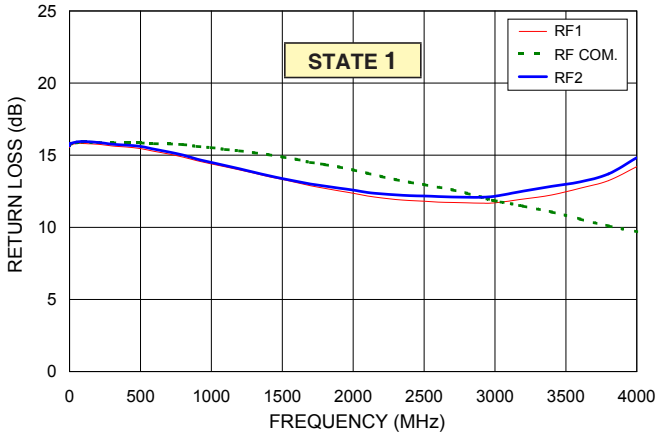
ISOLATION BETWEEN RF1/RF2 TO RF COM
Vs. FREQUENCY



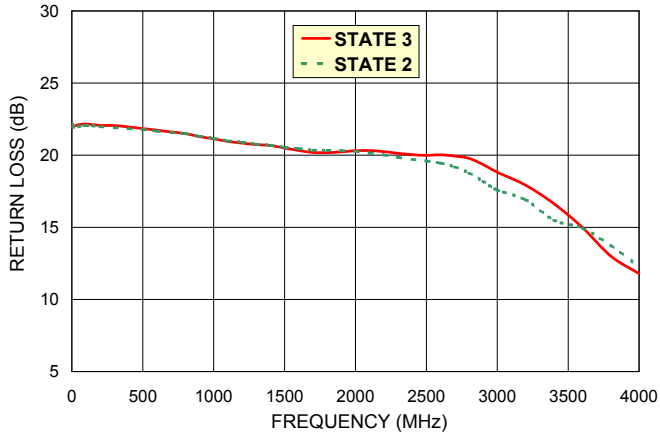
ISOLATION BETWEEN RF1 TO RF2
Vs. FREQUENCY



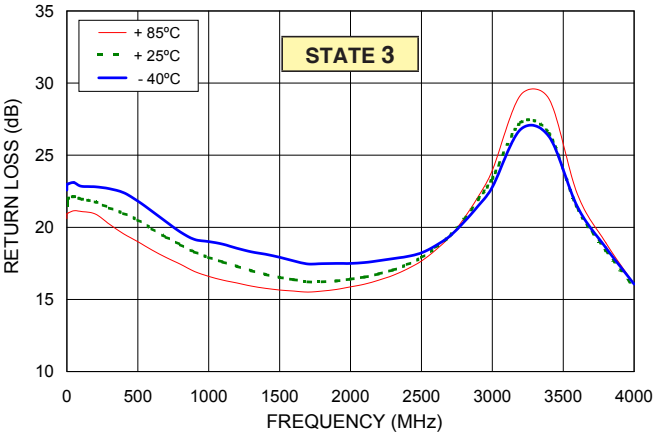
RF RETURN LOSS Vs. FREQUENCY @ +25°C



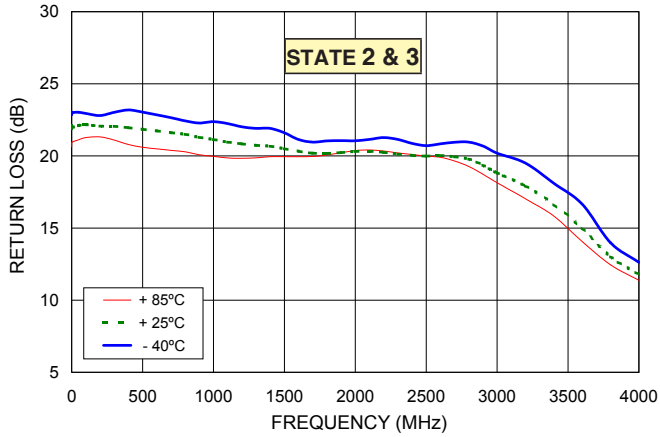
RF COM RETURN LOSS Vs. FREQUENCY @ +25°C



RF1 RETURN LOSS Vs. FREQUENCY



RF COM RETURN LOSS Vs. FREQUENCY



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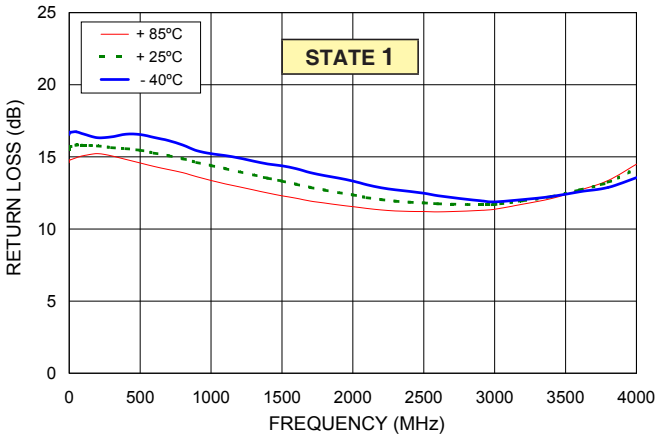
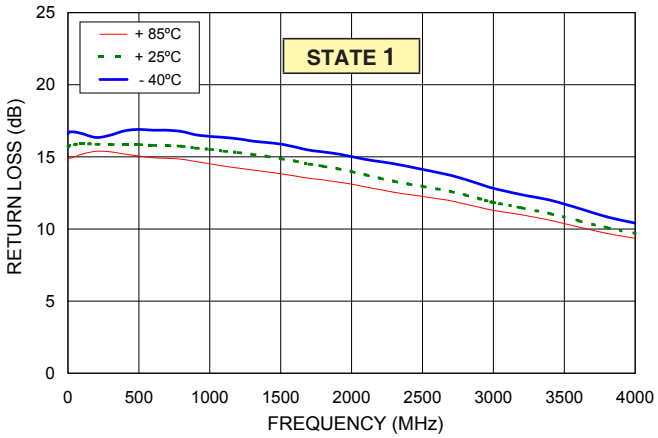
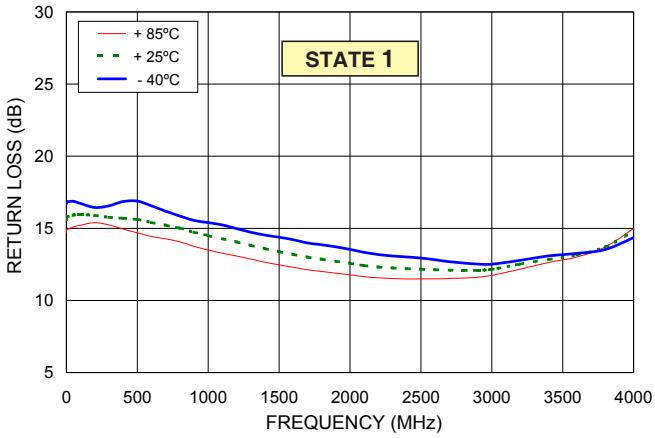
RF1 RETURN LOSS Vs. FREQUENCY



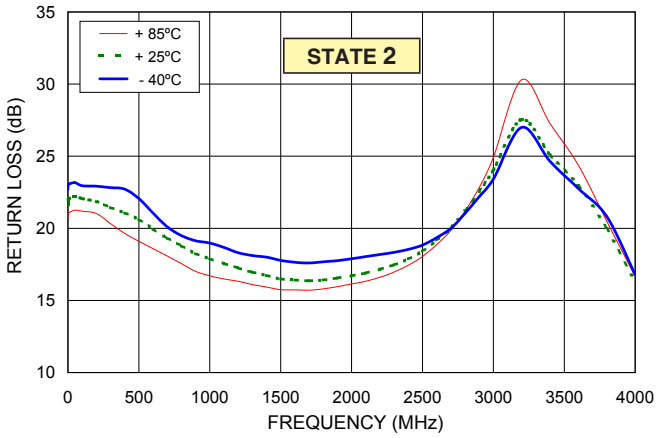
RF COM RETURN LOSS Vs. FREQUENCY



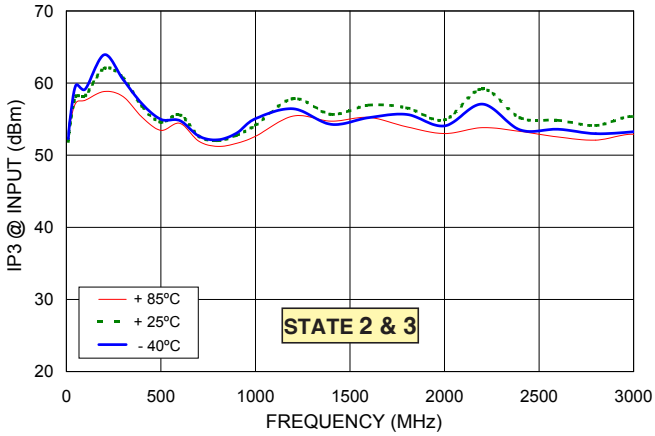
RF2 RETURN LOSS Vs. FREQUENCY



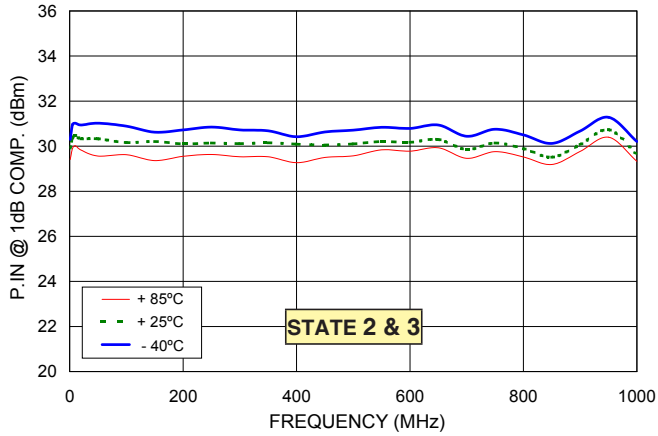
RF2 RETURN LOSS Vs. FREQUENCY



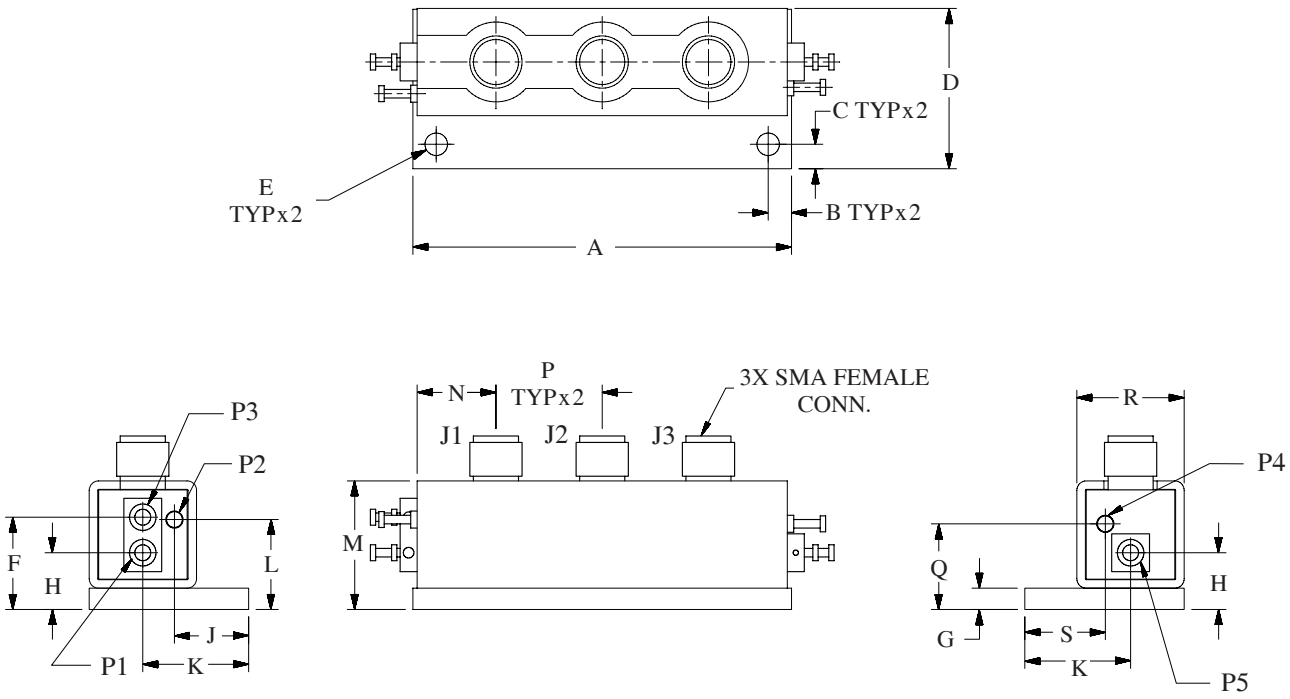
INPUT IP3 Vs. FREQUENCY



POWER IN @ 1dB COMPRESSION Vs. FREQUENCY



Outline Drawing (HL1162)



Outline Dimensions (inch / mm)

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	WT. GRAMS
1.780	**.110**	**.115**	**.750**	**.106**	**.430**	**.100**	**.270**	**.350**	**.500**	**.420**	**.610**	**.370**	**.500**	**.400**	**.500**	**.380**	56.0
45.21	2.79	2.92	19.05	2.69	10.92	2.54	6.86	8.89	12.70	10.67	15.49	9.39	12.70	10.16	12.70	9.65	