



Eyal Microwave Ltd.

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## Specification For

2 to 6 GHz

Modulator

MODEL: MOD-2350-05

### Item Definition and General Description

The Modulator Module is a broadband, nominally 2 GHz to 6 GHz unit.

Its major function is to shift down the frequency of a broadband RF signal by a fixed 70 MHz signal.

The RF input signal is modulated by a fixed 70 MHz Local Oscillator (Single-Side-Band modulation), the signal is then split into two independent amplification paths.

A BIT input may be injected through the input coupler.



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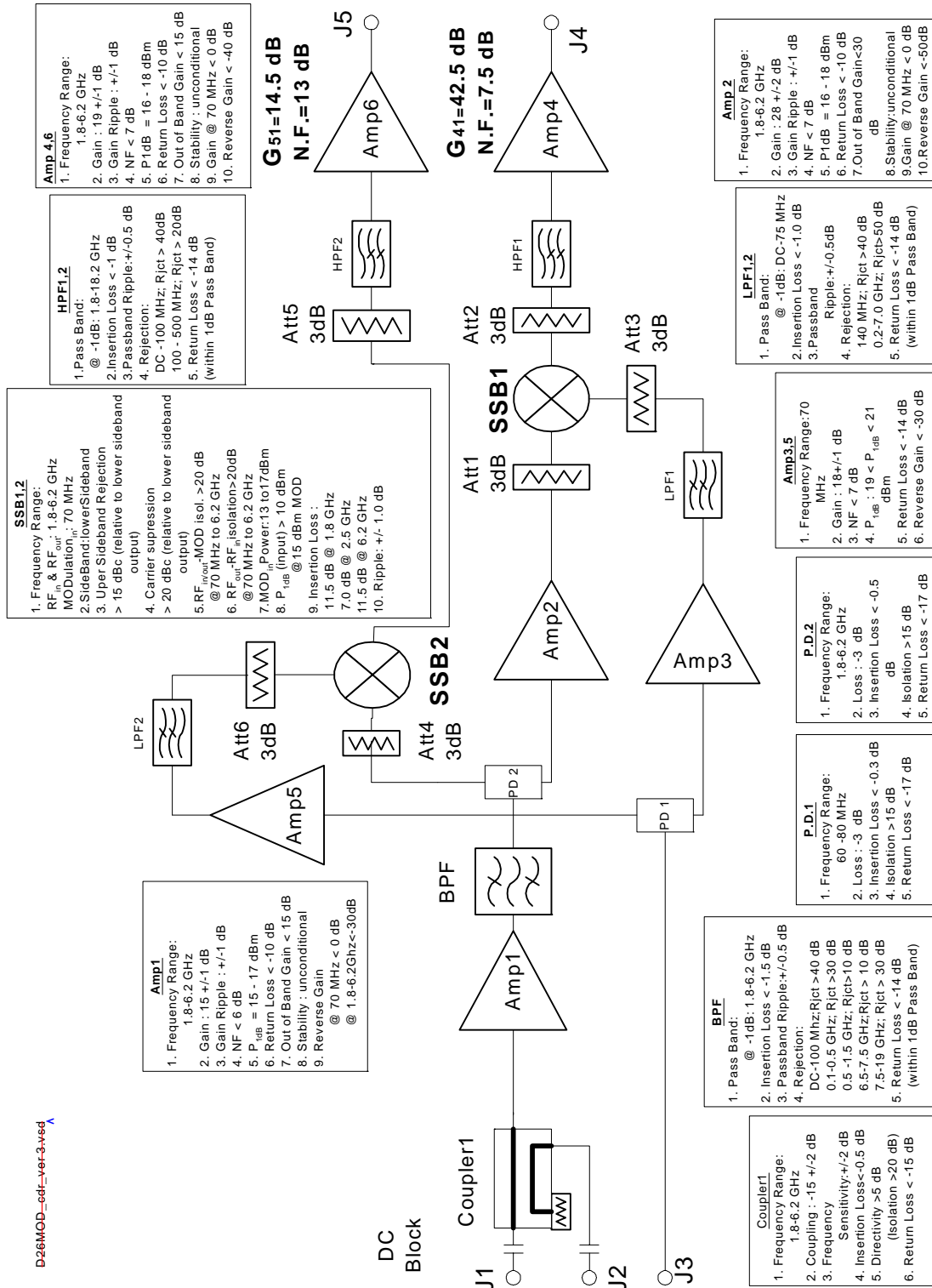
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**Block Diagram**



**Figure 1: Modulator Module**

D26MOD\_cdf\_ver3.wed



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## Electrical Specification

All specifications assume the application of Local Oscillator signal to J3 with +5 dBm power at 70 MHz.

Frequency range..... 2.0 ÷6.0 GHz

### Gain Limits

For RF path J1 to J4:

G.L.B.F.L @ 2.5 GHz: ..... 47 ± 1.5 dB

For RF path J1 to J5:

G.L.B.F.L @ 2.5 GHz: ..... 17.3 ± 1.0 dB

### Gain flatness:

For RF path J1 to J4:..... ± 2.5 dB

For RF path J1 to J5:..... ± 2.5 dB.

Noise figure J1 to J4 :..... 7.5 dB max.

Noise figure J1 to J5 :..... 13 dB max.

### Power output @1 dB Compression Point (input @ either J1 or J2):

Output @ J4:..... + 13 dBm min

Output @ J5:..... + 12 dBm min

### Input coupler characteristics (J2)

(The Gain Measured within the integrated unit):

G52 = G51 – 15 ±2 dB.

G42 = G41 – 15 ±2 dB.

Directivity: better than 5 dB (isolation better than 20 dB).

### Upper Sideband Rejection (2.5 to 6.0 GHz).

The power level of the upper sideband at J4 or J5 shall be less than the power of the lower sideband by more than 15 dB (for any input frequency and power).

### Carrier rejection (2.5 to 6.0 GHz).

The power level of the carrier at J4 or J5 shall be less than the power of the lower sideband by more than 19 dB (for any input frequency and power).

LO Leakage

The power measured at J4 or J5 around 70 MHz, when a +5 dBm 70 MHz signal is applied to J3..... -50 dBm.

The power measure at J1 at frequency 70 MHz, (when +5 dBm 70 MHz signal applied to J3) ..... -50 dBm.

L.O harmonics level at minimum signal input

J1-J4: The level of 70 MHz harmonics .....17 dBc  
at the output when the input signal is at level of -60 dBm and at frequency range of 2 to 3 GHz.

J1 – J5: The level of 70 MHz harmonics ..... 20 dBc  
at the output when the input signal is at level of -30 dBm and at frequency range of 2 to 3 GHz.

Reverse Modulation

The signal measured at J4 at frequency  $f \pm 70$  MHz, when a -5 dBm signal at frequency  $f$  (1.8-6.2 GHz) is applied to J5, (+5 dBm 70 MHz signal applied to J3).....-55 dBm.

The signal measured at J5 at frequency  $f \pm 70$  MHz, when a -5 dBm signal at frequency  $f$  (1.8-6.2 GHz) is applied to J4, (+5 dBm 70 MHz signal applied to J3)..... -55 dBm.

Returned Modulation

The signal returned to J1 at frequency  $f \pm 70$  MHz, when a -30 dBm signal at frequency  $f$  (1.8-6.2 GHz) is applied to J1, (+5 dBm 70 MHz signal applied to J3)..... - 80 dBm.  
(Measurement may be carried out using a circulator).

IF Isolation

The isolation between J4 & J5 @ 70 MHz..... 25 dB min.

RF Isolation

At J5 when a +5 dBm signal ( $f = 1.8 - 2.0$  GHz) is applied to J4..... -50dBm.

At J5 when a +5 dBm signal ( $f = 2.0 - 6.2$  GHz) is applied to J4..... -55dBm.

At J4 when a +5 dBm signal ( $f = 1.8 - 6.2$  GHz) is applied to J5..... -35 dBm.

RETURN - LOSS.

Impedance (all ports): 50  $\Omega$

Input Return-Loss (either J1 or J2)..... < -12 dB for small signal input.

Output Return-Loss..... < - 9.7 dB.

Max Operating RF Input Power: ..... +5 dBm

DC Voltages & Currents:.....+11 VDC  $\pm$ 10% 1300 mA max.

### Physical Characteristics and Connectors

The module packaged in hermetically sealed Aluminum case.  
The exact dimensions could vary.  
J1 and J3 RF connectors are GPO type (field replaceable to SMA).  
J2 RF connector is SMA female.  
The DC is Solder pins.

