



Series D60 Multi-Band DTOs



[How to Buy](#) Applications Notes for [Microwave Oscillators](#)

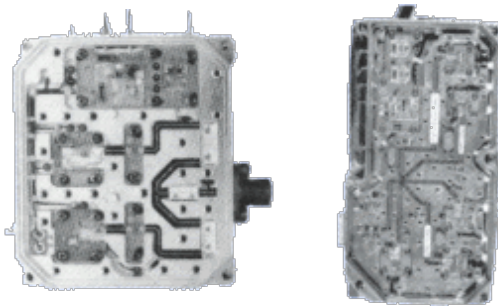
Simulator and Other Test Systems Applications

To obtain broadband frequency coverage, as well as to improve settling speed, two or more VCOs are combined, as shown in Fig. 1. A high-isolation RF switch is required to suppress all but the desired VCO. A switched lowpass filter is included in the output to reduce harmonic levels. The harmonic level for catalog units is specified at -20 dBc. However, -55 dBc suppression is available as an option.

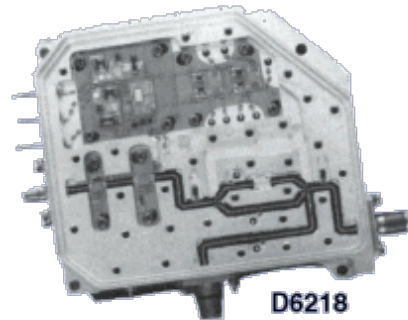
General Microwave offers multi-band DTOs covering the 0.5-2, 2-6, 6-18 and 2-18 GHz frequency ranges. The units feature high speed, high accuracy and low phase noise. The specifications are summarized on page 190. The modular design of the DTOs enables the user to select narrower frequency coverage if desired. Please consult the factory for individual requirements.



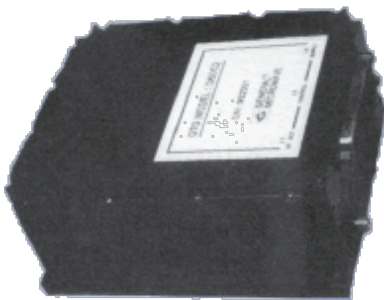
D6218 2-18 GHz DTO



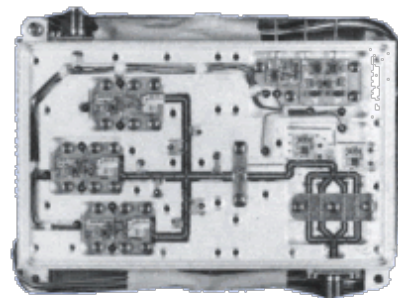
D6206 VCO Assembly D6618 VCO Assembly



D6218 Amplifier Assembly



D6052 0.5-2 GHz DTO



D6052 RF Assembly



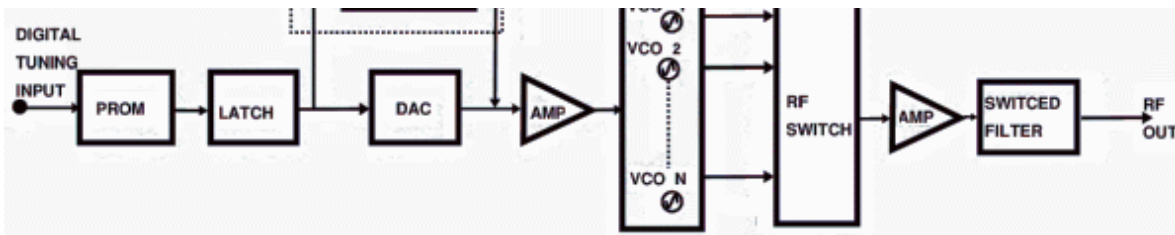


Fig. 1–Multi-Band DTO Block Diagram

MULTI-BAND DTO SPECIFICATIONS

PARAMETER	MODEL			
	D6052	D6206	D6618	D6218
FREQUENCY RANGE (GHz)	0.5-2	2-6	6-18	2-18
ACCURACY @ +25°C, max (MHz)	±2			
FREQUENCY DRIFT, max (MHz/°C)	±0.1			
FREQUENCY SETTling ⁽¹⁾ , (MHz) within 1 µsec	±2		±3 (6-12 GHz) ±4 (12-18 GHz)	±2 (2-6 GHz) ±3 (6-12 GHz) ±4 (12-18 GHz)
MODULATION ⁽²⁾ Bandwidth, min (MHz)	DC to 10			
Sensitivity variation Standard unit, typ	4:1			
Option 2 unit, max	1.1:1			
Frequency deviation bandwidth, min @ 2v P-P (MHz)	100	500		
RF POWER Output, min (dBm)	+10			
Variation, incl. temp. & freq. max (dB)	±2	±2.5		
PHASE NOISE, typ (dBc/Hz) @ 100 kHz offset	-65			
RESIDUAL FM, P-P @ -3 dBc, typ (kHz)	50	75	150	
HARMONICS, max (dBc) Standard Unit	-20			
Option 3 Unit	N/A	-55	-55	
f/2, 3f/2, max (dBc)	N/A			-55
SPURIOUS, max (dBc)	-60			
	±1			
PULLING VWSR 2:1 max (MHz)				
PUSHING, max (kHz/V)	±125	±250	±500	
NOMINAL LSB ⁽³⁾ (MHz)	0.5			
MONOTONICTY	Guaranteed			
CONNECTORS POWER				

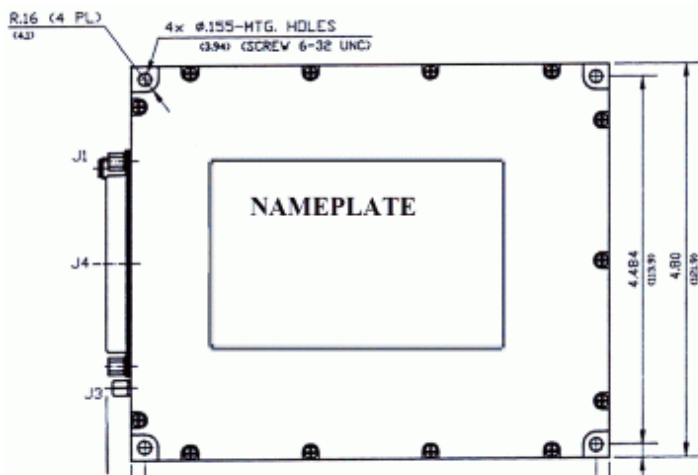
Power	9 pin, D type male ⁴				
Control	37 pin, D type male ⁴				
RF output	SMA female				
Modulation Input	SMC male				
POWER SUPPLY REQUEIRMENT (mA)					
+15V ±0.5V	450	700	1,000	1,250	
-15V ±0.5V	250	250	300	300	
+5V ±0.5V	150	150	500	500	
+28V ±2V	1,000	1,000	3,000	3,000	
Turn-On Current @ 28 volts	3 amps max		6 amps max		
ENVIRONMENTAL					
Operating temperature (°C)	0 to +70				
Storage temperature (°C)	-20 to +100				
MECHANICAL DIMENSIONS					
Inches	5.70 x 4.80 x 2.50		6.48 x 6.23 x 2.00		
Millimeters	144,8 x 121,9 x 63,5		164,6 x 158,2 x 50,8		

- (1) Δf relative to f after 1 sec
- (2) 50 Ohm input impedance
- (3) 16 Bit TTL input, including VCO control. See pages 191 and 192.
- (4) Mating connector furnished

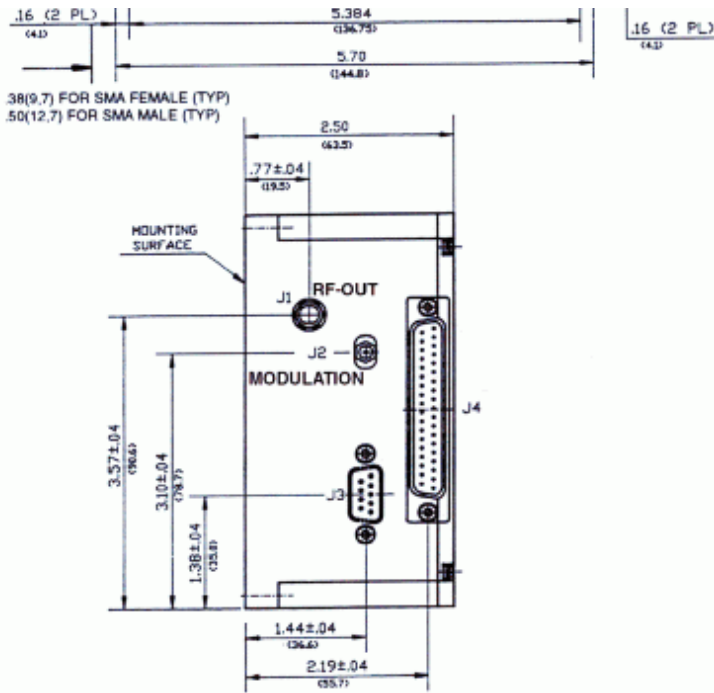
AVAILABLE OPTIONS

Option No.	Description
2	Reduced Modulation Sensitivity Variation
3	Improved Harmonic Suppression
4	SMA Female Modulation Connector
B09	13 to 20 GHz Operation
B11	Operating Temp. range -5 (°C) to +70 (°C)
B12	With options 2 & 3. Operating Temp. range -10 (°C) to +70 (°C)

DIMENSIONS AND WEIGHTS - Model D6052



MODELS D6052 Control Connector (J4)	
PIN NO.	FUNCTION
1	A13 Tuning Word (MSB)
2	A11 Tuning Word
3	A9 Tuning Word
4	A7 Tuning Word
5	A5 Tuning Word
6	A3 Tuning Word
7	A1 Tuning Word
8	V1 VCO Control (MSB)
9	L1 Latch 1 (Strobe)
10	L3 Latch 3
11	OE Memory Output Enable
12	D1 Data Bus



MODELS D6052 Power Connector (J3)			
PIN NO.	FUNCTION	PIN NO.	FUNCTION
1	+5V	6	Return for: +5V, +15V, -15V
2	-15V	7	Return for: +5V, +15V, -15V
3	+15V	8	+28V (return)
4	+28V (return)	9	+28V
5	+28V		

NOTES: For Normal Operation of the DTO

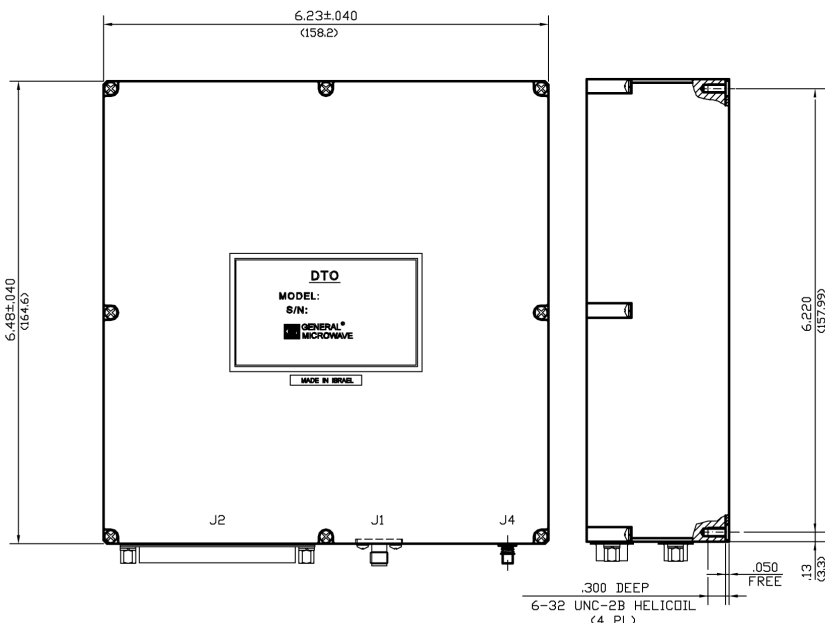
- 1) PIN nos. 9, 10 and 28 should be connected together.
- 2) PIN no. 11 should be grounded
- 3) PIN nos. 12, 13, 14, 15, 16, 17, 19, 30, 31, 32, 33, 34, 35 and 36 are for FACTORY PROGRAMMING ONLY and should not be connected.

Wt. 2.18 lb. (990 grams) approx.

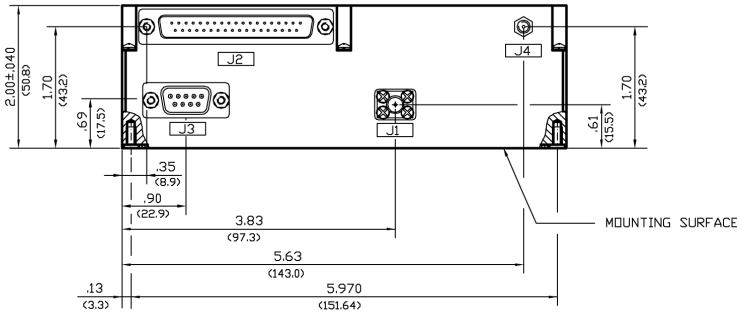
13	D3 Data Bus
14	D5 Data Bus
15	D7 Data Bus
16	W2 Write 2
17	OET2 Output Enable Transceiver 2
18	G Ground
19	WE Write Enable
20	A12 Tuning Word
21	A10 Tuning Word
22	A8 Tuning Word
23	A6 Tuning Word
24	A4 Tuning Word
25	A2 Tuning Word
26	A0 Tuning Word
27	V0 VCO Control (LSB)
28	L2 Latch 2
29	G Ground
30	D0 Data Bus
31	D2 Data Bus
32	D4 Data Bus
33	D6 Data Bus
34	W1 Write 1
35	OET1 Output Enable Transceiver 1
36	OET3 Output Enable Transceiver 3
37	G Ground

Dimensional Tolerances, unless otherwise indicated: .XX ± .02; .XXX ± .005

DIMENSIONS AND WEIGHT - MODELS D6206, D6218 and D6618



MODELS D6206, D6618 and D6218 Control Connector (J2)	
PIN NO.	FUNCTION
1	A14 Tuning Word (MSB)
2	A12 Tuning Word
3	A10 Tuning Word
4	A8 Tuning Word
5	A6 Tuning Word
6	A4 Tuning Word
7	A2 Tuning Word
8	V0 VCO Control Bit
9	L1 Latch 1 of 3 (Strobe)
10	L3 Latch 3 of 3 (Strobe)
11	OE Memory Output Enable
12	D1 Data Bus
13	D3 Data Bus
14	D5 Data Bus
15	D7 Data Bus
16	W2 Write select 2



MODELS D6026, D6618 and D6218 Power Connector (J3)			
PIN NO.	FUNCTION	PIN NO.	FUNCTION
1	+5V	6	Return (for +5V, +15V, -15V)
2	-15V	7	Return (for +5V, +15V, -15V)
3	+15V	8	+28V (return)
4	+28V (return)	9	+28V
5	+28V		

NOTES: For Normal Operation of the DTO

- 1) PIN nos. 9, 10 and 28 should be connected together (Latch enable).
- 2) PIN no. 11 should be grounded
- 3) PIN nos. 12, 13, 14, 15, 16, 17, 19, 30, 31, 32, 33, 34, 35 and 36 are for FACTORY PROGRAMMING ONLY and should not be connected.

17	OET2 Output Enable Transceiver 2
18	GND Ground
19	WE Write Enable
20	A13 Tuning Word
21	A11 Tuning Word
22	A9 Tuning Word
23	A7 Tuning Word
24	A5 Tuning Word
25	A3 Tuning Word
26	A1 Tuning Word
27	A0 Tuning Word (LSB)
28	L2 Latch 2 of 3 (Strobe)
29	G Ground
30	D0 Data Bus
31	D2 Data Bus
32	D4 Data Bus
33	D6 Data Bus
34	W1 Write select 1
35	OET1 Output Enable Transceiver 1
36	OET3 Output Enable Transceiver 3
37	GND Ground

Wt. 3.35 lb. (1.52 kg) approx.

Dimensional Tolerances, unless otherwise indicated: .XX ± .02; .XXX ± .005



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