

DESCRIPTION - SEMCO's TT05 Series is a multi-mode digital telemetry transmitter that is ideal for airborne and other transmitter applications requiring support of legacy PCM/FM modulation modes as well as the more spectrum-efficient ARTM Tier I SOQPSK-TG and Tier II Multi-h CPM. The transmitter's design combines small size (5 cubic inches) with excellent size to output power ratios. Programmable in 0.25, .5 and 1 MHz steps, the transmitter provides for frequency agility in lower and upper L-band as well as S-band. It is DC-Coupled for optimum performance; with an efficient maximum power draw of 900 mA (5W) and 1.3 A (10W) at 28 VDC.

The TT05 Transmitter's spectral mask is IRIG 106-13 Tier II phase noise compliant, and offers programmable data rates from 500 kbps to 23 Mbps (PCM/FM) and 500 kbps to 40 Mbps (SOQPSK-TG and Multi-h CPM).

Systems Engineering & Management Co.
 1430 Vantage Court
 Vista, CA 92081-8596



TT05 SERIES TRANSMITTER

RF OUTPUT	
CARRIER FREQUENCY (SPECIFY BAND):	D1: 1435.5 to 1534.5 MHz
	D2: 1750.0 to 1855.0 MHz
	EB: 2200.5 to 2394.5 MHz
STEP SIZE:	Channelized in 0.25/0.5/1.0 MHz Steps
CARRIER STABILITY:	Within $\pm 0.002\%$ over -20°C to $+70^{\circ}\text{C}$
POWER:	5/10 Watts Minimum (Specify)
VSWR:	1.5:1 Maximum
IMPEDANCE:	50 Ohms Nominal
LOADING:	Normal Operation into any Load VSWR and Phase Angle
OPEN/SHORT PROTECTION:	Internal Isolator
HARMONIC & SPURIOUS LEVEL:	In accordance with Latest IRIG Specifications
INCIDENTAL AM:	1% Maximum
WARM-UP TIME:	Less than 250 Milliseconds
DIGITAL INPUT	
DATA LEVELS:	TTL or RS422 Compatible (Specify)
CLOCK LEVELS:	TTL or RS422 Compatible (Specify)
MODULATION TYPES:	PCM/FM, SOQPSK, Multi-h CPM
BIT RATE:	PCM: 500 Kbits/Sec to 23 Mbits/Sec
	SOQPSK-TG/Multi-h CPM: 500 Kbits/Sec to 40 Mbits/Sec
SPECTRAL MASKS:	PCM/FM: Per IRIG 106-13 Spectral mask for PCM/FM (Tier 0)
	Deviation: $\pm 0.35 \times$ Bit Rate
	Conditioning: 6 Pole Bessel Digital Filter at $0.7 \times$ Bit Rate
	SOQPSK-TG: Per IRIG 106-13 Quaternary Spectral Mask (Tier 1)
MULTI-h/CPM: Per ARTM Spectral Mask (Tier 2)	
RANDOMIZER:	15 Stage IAW IRIG 106-13

POWER REQUIREMENTS	
INPUT VOLTAGE:	+28 ± 4 VDC: Reverse Polarity Protected
INPUT OVERVOLTAGE:	+40 VDC for 30 Seconds with No Damage
INPUT CURRENT @ +28 VDC:	5 Watts: 900 Milliamps Maximum
	10 Watts: 1.3 Amps Maximum

Systems Engineering & Management Co.
1430 Vantage Court
Vista, CA 92081-8596

(800) 995-0636, ext. 1125
(760) 727-5200 (fax)
www.semco.com



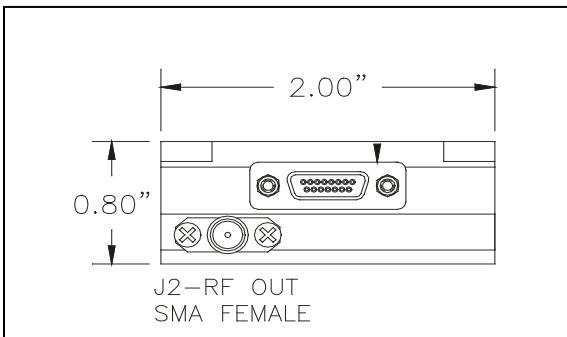
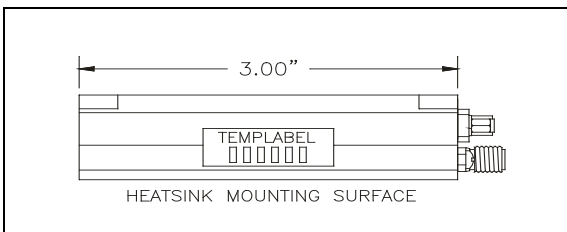
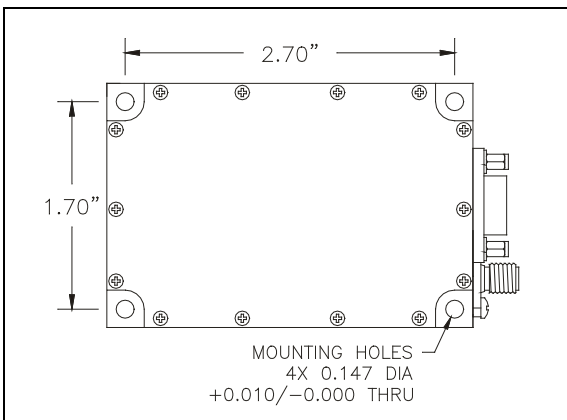
Technology and Innovation for a Safer World

ENVIRONMENTAL SPECIFICATIONS

TEMPERATURE:	Operating: -20° to +70°C; Storage: -54°C to +125°C
VIBRATION:	14 G's, Random, Standard Haystack, 20 Hz to 2 KHz, 3 Axes
SHOCK:	1/2 Sine, 100 G's Pk, 11 mS, 3 Axes
ACCELERATION:	100 G's, 3 Axes
ALTITUDE:	Unlimited
HUMIDITY:	To 95% at any Temperature forming Frost or Condensation

PHYSICAL CHARACTERISTICS

DIMENSIONS:	Per Outline Drawing
Weight:	5.5 oz Maximum



J1-PWR/DIGITAL IN ALTERNATE TTL PINOUT MDM-15P

PIN #	
1	RS232 TX
2	RF ON/OFF
3	RS232 GND
4	TTL DATA
5	TTL CLOCK
6	RF HIGH/LOW
7	PWR GND
8	POWER +28 VDC
9	RS232 RX
10	RECALL
11	N/C
12	N/C
13	N/C
14	POWER GND
15	POWER +28 VDC

J1-PWR/DIGITAL IN ALTERNATE 422 PINOUT MDM-15P

PIN #	
1	POWER +28VDC
2	POWER GND
3	RF HIGH/LOW
4	+RS422 CLOCK
5	+RS422 DATA/ N/C
6	RS232 GND
7	RF ON/OFF
8	RS232 RX
9	POWER +28 VDC
10	POWER GND
11	N/C
12	-RS422 CLOCK
13	-RS422 DATA
14	RECALL
15	RS232 RX

Protected by one or more of the following patents:

US: 5,097,230, 5,311,152, 5,426,466, 6,404,292, 6,411,237, 6,417,738, 6,650,180, 6,683,499, 6,690,238, 6,747,517, 6,771,133, 6,900,696, 6,922,106, 7,190,229, 7,936,218 and 8,188,794.

Canadian: 2,033,861, 2,033,878, 2,080,013, 2,111,486, 2,235,091, 2,299,133, 2,306,977, 2,308,209, 2,313,132, 2,374,784, 2,374,794, 2,420,710 and 2,432,778.

Other US and Canadian patents pending

Systems Engineering & Management Co.
1430 Vantage Court
Vista, CA 92081-8596

(800) 995-0636, ext. 1125
(760) 727-5200 (fax)

www.semco.com



TT05 SERIES TRANSMITTER

TT05-EB D 103-0 1 0 4 3 0

TELEMETRY TRANSMITTER; 5 IN³

(ADDITIONAL OPTIONS 1-6)

FREQUENCY BAND	
D1:	1435.5 to 1534.5 MHz
D2:	1750.0 to 1855.0 MHz
EB:	2200.5 to 2394.5 MHz

OUTPUT POWER [†]	
103:	10W
502:	5W
† Low power option available	

DC COUPLED

ADDITIONAL OPTIONS 1		ADDITIONAL OPTIONS 2		ADDITIONAL OPTIONS 3	
CODE	OPTION	CODE	OPTION	CODE	OPTION
0	NO OPTIONS	1	M83513/04-B07N CONNECTOR	0	NO OPTIONS
1	LOW TEMP	2	M83513/03-B07N CONNECTOR	2	FORWARD ERROR CORRECTION*
2	HIGH TEMP	4	CLOCK FREE INTERFACE	4	TEMPERATURE READOUT
3	HIGH TEMP + LOW TEMP	5	CLOCK FREE + M83513/04-B07N	6	TEMPERATURE READOUT + FORWARD ERROR CORRECTION*
4	MULTIPLE POWER	6	CLOCK FREE + M83513/03-B07N	8	RANDOMIZER
5	MULTIPLE POWER + LOW TEMP	8	INTERNAL CLOCK DATA	A	RANDOMIZER + FORWARD ERROR CORRECTION*
6	MULTIPLE POWER + HIGH TEMP	9	INTERNAL CLOCK DATA + M83513/04-B07N	C	RANDOMIZER + TEMP READOUT
7	MULTIPLE POWER + LOW TEMP + HIGH TEMP	A	INTERNAL CLOCK DATA + M83513/03-B07N	E	RANDOMIZER + TEMP READOUT + FORWARD ERROR CORRECTION*
		C	INTERNAL CLOCK DATA + CLOCK FREE INTERFACE		
		D	INTERNAL CLOCK DATA + CLOCK FREE INTERFACE + M83513/04-B07N		
		E	INTERNAL CLOCK DATA + CLOCK FREE INTERFACE + M83513/03-B07N		

ADDITIONAL OPTIONS 4		ADDITIONAL OPTIONS 5		ADDITIONAL OPTIONS 6	
CODE	OPTION	CODE	OPTION	CODE	OPTION
1	TTL CLOCK AND DATA	0	NO OPTIONS	0	NO OPTIONS
2	RS422 CLOCK AND DATA	1	PCM-FM	2	RF H/L (EXTERNAL CONTROL)
4	SERIAL CONTROL (RS232)	2	SOQPSK	4	RECALL (EXTERNAL)
5	SERIAL CONTROL (RS232) + TTL CLOCK AND DATA	3	PCM-FM + SOQPSK	6	RECALL + RF H/L (EXTERNAL)
6	SERIAL CONTROL (RS232) + RS422 CLOCK AND DATA	4	MULTI-H CPM	8	TRANSMITTER ENABLE (EXTERNAL)
7	RS422 CLOCK AND DATA + TTL CLOCK AND DATA	5	MULTI-H CPM + PCMFm	A	TRANSMITTER ENABLE + RF H/L (EXTERNAL)
8	PARALLEL CONTROL (TTL)*	6	MULTI-H CPM + SOQPSK	C	TRANSMITTER ENABLE + RECALL (EXTERNAL)
9	PARALLEL CONTROL (TTL) + TTL CLOCK AND DATA*	7	MULTI-H CPM + SOQPSK + PCM-FM		
A	PARALLEL CONTROL (TTL) + RS422 CLOCK AND DATA*				
C	PARALLEL CONTROL (TTL) + SERIAL CONTROL*				
D	PARALLEL CONTROL (TTL) + SERIAL CONTROL + TTL CLOCK AND DATA*				
E	PARALLEL CONTROL (TTL) + SERIAL CONTROL + RS422 CLOCK AND DATA*				

* OPTION IN DEVELOPMENT

Systems Engineering & Management Co.
1430 Vantage Court
Vista, CA 92081-8596

(800) 995-0636, ext. 1125
(760) 727-5200 (fax)

www.semco.com



Technology and Innovation for a Safer World