



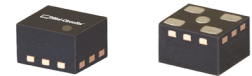
# E-PHEMT Transistor

## TAV1-541+

50Ω 0.045 to 6 GHz

### THE BIG DEAL

- Low Noise Figure, 0.4 dB
- Gain, 24 dB typ. at 0.9 GHz
- High Output IP3, +32 dBm at 2 GHz, 60mA, 4V
- Output Power at 1dB compression, +21 dBm, 60mA, 4V
- Wide bandwidth
- External biasing and matching required



Generic photo used for illustration purposes only

CASE STYLE: TE2769

#### +RoHS Compliant

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

### APPLICATIONS

- Cellular
- ISM
- GSM
- WCDMA
- WiMax
- WLAN
- UNII and HIPERLAN

### PRODUCT OVERVIEW

TAV1-541+ is a low noise, high IP3 transistor device manufactured using E-PHEMPT\* technology enabling it to work with a single positive supply voltage. It has outstanding Noise figure, particularly below 2.5 GHz, and when combining this noise figure with IP3 performance in a single device it makes it an ideal amplifier for multiple applications.

### KEY FEATURES

Feature	Advantages
Wideband, 0.045 to 6 GHz	Use in multiple applications: UHF, VHF, communication infrastructure
High Gain, Low noise figure	High Gain limits the effect of noise figure due to previous stages
Small size, 1.18 x 1.42 x 0.85 mm, MCLP package	Small foot print saves space in dense layouts while providing low inductance, repeatable transitions, and excellent thermal contact to the PCB.

\* Enhancement mode Pseudomorphic High Electron Mobility Transistor.



ULTRA LOW NOISE, HIGH CURRENT

# E-PHEMT Transistor

**TAV1-541+**

**ELECTRICAL SPECIFICATIONS AT  $T_{AMB}=25^{\circ}C$ , FREQUENCY 0.045 TO 6 GHz**

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units	
<b>DC Specifications</b>							
$V_{GS}$	Operational Gate Voltage	$V_{DS}=3V, I_{DS}=60\text{ mA}$	0.37	0.48	0.69	V	
$V_{TH}$	Threshold Voltage	$V_{DS}=3V, I_{DS}=4\text{ mA}$	0.18	0.26	0.38	V	
$I_{DSS}$	Saturated Drain Current	$V_{DS}=3V, V_{GS}=0\text{ V}$	—	1.0	5.0	$\mu\text{A}$	
$G_M$	Transconductance	$V_{DS}=3V, G_m = \Delta I_{DS} / \Delta V_{GS}$ $\Delta V_{GS} = V_{GS2} - V_{GS1}$ $V_{GS1} = V_{GS1}$ at $I_{DS}=60\text{ mA}$ $V_{GS2} = V_{GS1} + 0.05V$	230	392	560	mS	
$I_{GSS}$	Gate leakage Current	$V_{GD}=V_{GS}=-3V$	—	—	200	$\mu\text{A}$	
<b>RF Specifications<sup>1</sup>, <math>Z_0=50\text{ Ohms}</math> (Figure 1)</b>							
NF	Noise Figure	$V_{DS}=3V, I_{DS}=60\text{ mA}$	f=0.9 GHz	—	0.4	0.9	dB
			f=2.0 GHz	—	0.6		
			f=3.9 GHz	—	0.9		
			f=5.8 GHz	—	1.4		
		$V_{DS}=4V, I_{DS}=60\text{ mA}$	f=2.0 GHz	—	0.7		
Gain	Gain	$V_{DS}=3V, I_{DS}=60\text{ mA}$	f=0.9 GHz	16.4	24.1	20.4	dB
			f=2.0 GHz	16.4	18.6		
			f=3.9 GHz	16.4	13.3		
			f=5.8 GHz	16.4	9.3		
		$V_{DS}=4V, I_{DS}=60\text{ mA}$	f=2.0 GHz	16.4	18.6		
OIP3	Output IP3	$V_{DS}=3V, I_{DS}=60\text{ mA}$	f=0.9 GHz	—	32	—	dBm
			f=2.0 GHz	—	31.4		
			f=3.9 GHz	—	31.7		
			f=5.8 GHz	—	31.9		
		$V_{DS}=4V, I_{DS}=60\text{ mA}$	f=2.0 GHz	—	33.9		
P1dB <sup>2</sup>	Power output at 1 dB Compression	$V_{DS}=3V, I_{DS}=60\text{ mA}$	f=0.9 GHz	—	18.2	—	dBm
			f=2.0 GHz	—	18.4		
			f=3.9 GHz	—	18.6		
			f=5.8 GHz	—	18.3		
		$V_{DS}=4V, I_{DS}=60\text{ mA}$	f=2.0 GHz	—	20.7		



ULTRA LOW NOISE, HIGH CURRENT

# E-PHEMT Transistor

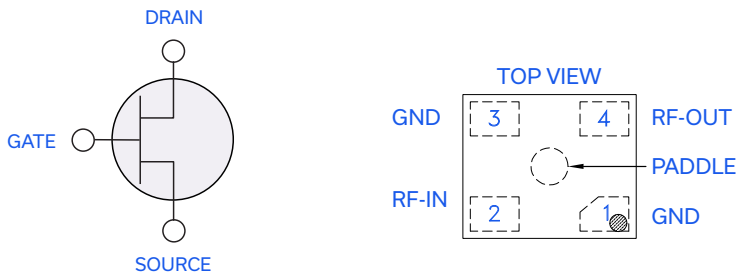
## TAV1-541+

### MAXIMUM RATINGS<sup>3</sup>

Symbol	Parameter	Max.	Units
$V_{DS}^{(4)}$	Drain-Source Voltage	5	V
$V_{GS}^{(4)}$	Gate-Source Voltage	-5 to 0.7	V
$V_{GD}^{(4)}$	Gate-Drain Voltage	-5 to 0.7	V
$I_{DS}^{(4)}$	Drain Current	120	mA
$I_{CS}$	Gate Current	2	mA
$P_{DISS}$	Total Dissipated Power	360	mW
$P_{IN}^{(5)}$	RF Input Power	17	dBm
$T_{CH}$	Channel Temperature	150	°C
$T_{OP}$	Operating Temperature	-40 to 85	°C
$T_{STD}$	Storage Temperature	-65 to 150	°C
$\Theta_{JC}$	Thermal Resistance	160	°C/W

- 2. Drain current bias is allowed to increase during compression measurement.
- 3. Operation of this device above any one of these parameters may cause permanent damage
- 4. Assumes DC quiescent conditions
- 5.  $I_{GS}$  is limited to 2 mA during test.

### SIMPLIFIED SCHEMATIC AND PIN DESCRIPTION



Function	Pin Number	Description
RF-IN	2	Gate used for RF input
RF-OUT	4	Drain used for RF output
GND	1,3 and Paddle	Source terminal and Paddle, normally connected to ground.



ULTRA LOW NOISE, HIGH CURRENT

# E-PHEMT Transistor

## TAV1-541+

### CHARACTERIZATION TEST CIRCUIT

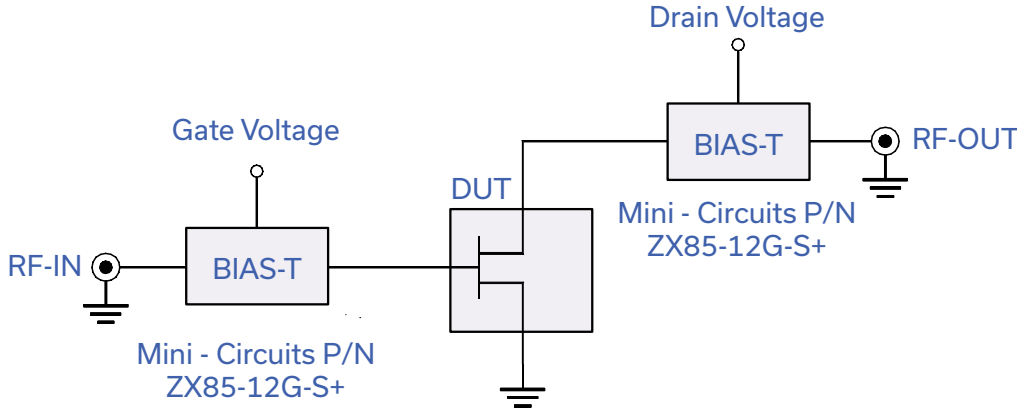


Fig 1. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Test Board TB-TAV1-541+)

Gain, Output power at 1dB compression (P1 dB), Noise Figure and output IP3 (OIP3) are measured using Keysight/Agilent Network Analyzer PNA-X.

Conditions:

1. Drain voltage (with reference to source, VDS)= 3 or 4V as shown.
2. Gate Voltage (with reference to source, VGS) is set to obtain desired Drain-Source current (IDS) as shown in specification table.
3. Gain: Pin= -25dBm
4. Output IP3 (OIP3): Two tones, spaced 1 MHz apart, 0 dBm/tone at output.
5. No external matching components used.

### PRODUCT MARKING



Marking may contain other features or characters for internal lot control





ULTRA LOW NOISE, HIGH CURRENT

# E-PHEMT Transistor

## TAV1-541+

Mini-Circuits

ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASH BOARD. TO ACCESS [CLICK HERE](#)

Performance Data	Data Table Swept Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	TE2769 Plastic package, exposed paddle, lead finish: Matte-Tin plated
Tape & Reel Standard quantities available on reel	F90 7" reels with 20, 50, 100, 200, 500,1K,2K or 3K devices
Suggested Layout for PCB Design	98-PL-665
Evaluation Board	TB-TAV1-541+
Environmental Ratings	ENV08T2

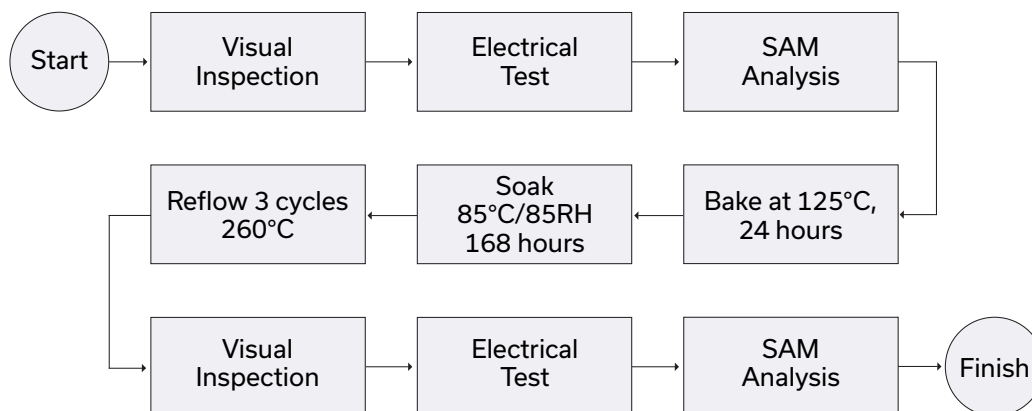
### ESD RATING

Human Body Model (HBM): Class 1A (250V to <500V) in accordance with ANSI/ESD STM 5.1 - 2001

### MSL RATING

Moisture Sensitivity: MSL1 in accordance with IPC/JEDEC J-STD-020D

### MSL TEST FLOW CHART



- NOTES**
- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
  - B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
  - C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard. Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)



## Typical Performance Data

VDS (V)	IDS (mA) @ VGS=					
	0.20V	0.30V	0.40V	0.50V	0.60V	0.70V
0.00	0.01	0.04	0.08	0.08	0.10	0.09
0.10	0.27	3.65	12.61	18.97	21.95	23.61
0.20	0.29	4.15	18.82	34.57	42.39	46.35
0.30	0.30	4.34	20.58	45.11	60.56	68.02
0.40	0.33	4.50	21.37	50.24	75.24	88.05
0.50	0.34	4.65	21.90	52.30	85.18	105.70
0.60	0.34	4.85	22.33	53.38	90.38	120.00
0.70	0.36	4.99	22.76	54.18	92.66	
0.80	0.38	5.13	23.24	54.89	93.88	
0.90	0.40	5.25	23.62	55.49	94.80	
1.00	0.42	5.38	23.97	56.03	95.53	
1.10	0.43	5.51	24.29	56.51	96.14	
1.20	0.45	5.63	24.61	56.97	96.68	
1.30	0.45	5.75	24.91	57.39	97.18	
1.40	0.47	5.86	25.22	57.82	97.65	
1.50	0.48	5.98	25.50	58.21	98.08	
1.60	0.52	6.10	25.77	58.60	98.49	
1.70	0.53	6.21	26.04	58.97	98.89	
1.80	0.55	6.32	26.32	59.33	99.30	
1.90	0.57	6.45	26.58	59.70	99.68	
2.00	0.55	6.55	26.87	60.08	100.07	
2.10	0.58	6.69	27.17	60.50	100.48	
2.20	0.60	6.82	27.51	60.97	100.97	
2.30	0.63	6.99	27.89	61.47	101.50	
2.40	0.64	7.17	28.29	62.05	102.12	
2.50	0.67	7.34	28.74	62.68	102.78	
2.60	0.70	7.52	29.19	63.32	103.50	
2.70	0.71	7.69	29.65	63.99	104.22	
2.80	0.73	7.90	30.15	64.64	104.94	
2.90	0.76	8.10	30.62	65.31	105.64	
3.00	0.82	8.34	31.13	65.99	106.33	
3.10	0.84	8.56	31.63	66.65	107.02	
3.20	0.87	8.79	32.17	67.32	107.70	
3.30	0.90	9.03	32.72	68.02	108.37	
3.40	0.92	9.30	33.28	68.69	109.02	
3.50	0.95	9.58	33.87	69.41	109.67	
3.60	1.01	9.89	34.46	70.12	110.34	
3.70	1.06	10.20	35.06	70.81	111.00	
3.80	1.10	10.53	35.67	71.53	111.64	
3.90	1.14	10.86	36.29	72.24	112.30	
4.00	1.14	11.21	36.89	72.93	112.96	
4.10	1.30	11.55	37.51	73.65	113.60	
4.20	1.37	11.90	38.13	74.35	114.25	
4.30	1.45	12.26	38.74	75.03	114.88	
4.40	1.54	12.63	39.36	75.76	115.53	
4.50	1.62	13.00	39.99	76.47	116.18	
4.60	1.69	13.38	40.62	77.15	116.80	
4.70	1.78	13.76	41.23	77.86	117.44	
4.80	1.90	14.14	41.86	78.56	118.06	
4.90	1.98	14.53	42.50	79.26	118.67	
5.00	2.07	14.94	43.13	79.96	119.30	

*Typical Performance Data*

**Definitions:**

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 3V @ Temperature = +25°C

FREQ (MHz)	Gain (dB)	Isolation (dB)	Input Return Loss (dB)	Output Return Loss (dB)	Stability		IP-3 Output (dBm)	1dB Comp. Output (dBm)	Noise Figure (dB)
					K	Measure			
70	29.20	44.95	0.01	6.12	0.02	1.51	31.57	17.77	0.57
80	29.17	44.65	0.03	6.13	0.04	1.50	33.61	17.75	0.48
90	29.15	42.76	0.03	6.17	0.01	1.51	32.09	18.02	0.55
100	29.13	42.01	0.04	6.19	0.05	1.50	31.99	18.06	0.46
200	28.78	36.52	0.21	6.50	0.07	1.50	32.61	17.81	0.48
300	28.28	33.31	0.45	6.91	0.11	1.47	32.00	17.73	0.51
400	27.68	31.48	0.72	7.40	0.14	1.45	32.63	17.99	0.51
500	27.00	30.12	1.00	7.93	0.18	1.42	32.41	17.63	0.54
600	26.30	29.13	1.26	8.43	0.21	1.40	32.31	17.94	0.55
700	25.57	28.58	1.53	8.94	0.25	1.39	32.19	18.01	0.61
800	24.89	28.04	1.73	9.38	0.28	1.38	31.42	18.06	0.44
900	24.21	27.67	1.92	9.84	0.32	1.37	31.56	18.07	0.44
1000	23.57	27.34	2.07	10.23	0.35	1.36	32.23	18.27	0.48
1100	22.95	27.10	2.21	10.64	0.38	1.35	32.16	18.05	0.40
1200	22.36	26.84	2.33	11.01	0.41	1.35	31.48	18.04	0.38
1300	21.81	26.59	2.42	11.31	0.44	1.34	31.10	18.09	0.42
1400	21.28	26.38	2.52	11.60	0.47	1.34	31.82	18.16	0.45
1500	20.78	26.27	2.59	11.84	0.50	1.34	31.89	17.97	0.41
1600	20.29	26.10	2.68	12.13	0.53	1.33	32.72	18.43	0.44
1700	19.84	25.95	2.71	12.36	0.56	1.33	31.00	17.99	0.48
1800	19.40	25.75	2.78	12.55	0.58	1.33	32.06	18.42	0.51
1900	18.98	25.62	2.83	12.75	0.61	1.33	32.83	18.19	0.58
2000	18.59	25.48	2.87	12.93	0.63	1.33	31.08	18.25	0.57
2100	18.21	25.38	2.91	13.10	0.66	1.33	32.26	18.50	0.55
2200	17.86	25.26	2.94	13.21	0.68	1.33	32.67	18.32	0.52
2300	17.51	25.07	2.98	13.32	0.70	1.32	31.45	18.28	0.62
2400	17.18	24.96	3.00	13.43	0.72	1.32	32.48	18.67	0.53
2500	16.86	24.87	3.03	13.55	0.74	1.32	31.84	18.32	0.59
2600	16.55	24.72	3.06	13.64	0.76	1.32	31.97	18.49	0.55
2700	16.26	24.56	3.08	13.69	0.77	1.32	30.57	18.42	0.69
2800	15.97	24.44	3.11	13.75	0.79	1.32	31.63	18.42	0.69
2900	15.70	24.31	3.14	13.76	0.81	1.32	32.36	18.53	0.69
3000	15.42	24.18	3.17	13.82	0.83	1.31	32.14	18.43	0.58
3100	15.16	24.07	3.19	13.85	0.84	1.31	32.40	18.37	0.76
3200	14.90	23.97	3.22	13.89	0.86	1.31	32.71	18.39	0.79
3300	14.66	23.82	3.23	13.99	0.87	1.31	32.67	18.64	0.74
3400	14.42	23.68	3.25	14.05	0.89	1.31	32.61	18.56	0.83
3500	14.19	23.54	3.26	14.10	0.90	1.31	32.47	18.58	0.78
3600	13.96	23.45	3.26	14.11	0.91	1.31	31.93	18.67	0.87
3700	13.74	23.35	3.27	14.15	0.93	1.31	32.14	18.37	0.84
3800	13.51	23.21	3.26	14.11	0.94	1.31	31.86	18.44	0.85
3900	13.29	23.10	3.27	14.10	0.95	1.31	32.26	18.41	0.96
4000	13.08	22.99	3.25	14.05	0.96	1.31	31.62	18.15	0.96
4100	12.86	22.90	3.24	14.00	0.97	1.31	32.84	18.56	0.98
4200	12.66	22.78	3.21	13.93	0.98	1.31	31.83	18.35	0.93
4300	12.44	22.67	3.19	13.83	0.99	1.31	32.21	18.42	0.95
4400	12.24	22.58	3.16	13.75	1.00	1.31	31.93	18.46	1.09
4500	12.03	22.48	3.14	13.61	1.01	1.31	31.54	18.14	1.12
4600	11.82	22.39	3.10	13.48	1.02	1.31	32.13	18.47	1.06
4700	11.61	22.30	3.07	13.33	1.03	1.31	32.02	18.48	1.07
4800	11.40	22.24	3.04	13.19	1.04	1.31	31.38	18.19	1.28
4900	11.20	22.18	2.99	13.01	1.04	1.31	31.61	18.46	1.17
5000	10.98	22.11	2.95	12.81	1.05	1.31	32.58	18.48	1.12
5100	10.78	22.06	2.91	12.63	1.06	1.31	31.66	18.29	1.28
5200	10.58	21.96	2.86	12.47	1.06	1.31	31.74	18.16	1.50
5300	10.37	21.93	2.83	12.31	1.07	1.31	31.89	18.18	1.32
5400	10.18	21.85	2.78	12.18	1.08	1.32	31.79	18.00	1.48
5500	9.98	21.79	2.75	12.06	1.09	1.32	30.65	17.76	1.33
5600	9.80	21.71	2.71	11.94	1.09	1.32	31.34	18.08	1.31
5700	9.60	21.70	2.67	11.83	1.10	1.32	32.05	18.07	1.50
5800	9.42	21.60	2.63	11.68	1.10	1.32	31.57	18.11	1.36
5900	9.22	21.57	2.59	11.49	1.11	1.32	31.14	18.26	1.47
6000	9.04	21.51	2.55	11.33	1.11	1.32	31.76	18.16	1.51



*Typical Performance Data*

**Definitions:**

Input Return Loss = -S11 (dB)

Gain(Power Gain) = S21 (dB)

Reverse Isolation = -S12 (dB)

Output Return Loss = -S22 (dB)

TEST CONDITIONS: Vd = 4V @ Temperature = +25°C

FREQ (MHz)	Gain (dB)	Isolation (dB)	Input Return Loss (dB)	Output Return Loss (dB)	Stability		IP-3 Output (dBm)	1dB Comp. Output (dBm)	Noise Figure (dB)
					K	Measure			
70	29.29	45.34	0.01	5.59	0.01	1.45	29.33	19.19	0.63
80	29.26	44.61	0.03	5.62	-0.01	1.45	29.53	19.29	0.60
90	29.24	42.93	0.03	5.65	0.04	1.44	30.18	19.55	0.69
100	29.21	42.31	0.04	5.69	0.03	1.45	30.21	19.59	0.59
200	28.83	36.36	0.21	6.06	0.07	1.44	31.50	19.62	0.59
300	28.31	33.50	0.44	6.51	0.10	1.44	31.66	19.54	0.56
400	27.70	31.51	0.72	7.05	0.14	1.42	31.25	19.92	0.59
500	27.01	30.24	1.01	7.63	0.18	1.41	31.98	19.73	0.62
600	26.31	29.35	1.26	8.19	0.21	1.40	32.14	20.03	0.63
700	25.58	28.69	1.53	8.76	0.25	1.39	31.96	20.14	0.67
800	24.89	28.14	1.73	9.26	0.28	1.38	32.40	20.21	0.55
900	24.21	27.77	1.92	9.78	0.31	1.37	32.89	20.33	0.51
1000	23.57	27.37	2.07	10.23	0.35	1.36	32.89	20.41	0.57
1100	22.95	27.17	2.21	10.69	0.38	1.36	32.74	20.30	0.46
1200	22.36	26.95	2.33	11.11	0.41	1.36	33.29	20.31	0.49
1300	21.80	26.71	2.42	11.48	0.44	1.36	32.92	20.38	0.47
1400	21.28	26.52	2.52	11.81	0.47	1.35	33.44	20.53	0.51
1500	20.77	26.40	2.59	12.12	0.50	1.35	33.13	20.40	0.47
1600	20.28	26.26	2.68	12.45	0.53	1.35	33.91	20.59	0.55
1700	19.83	26.10	2.72	12.73	0.56	1.35	33.33	20.55	0.58
1800	19.39	25.94	2.78	12.96	0.58	1.35	34.06	20.69	0.60
1900	18.97	25.78	2.83	13.20	0.61	1.35	33.33	20.63	0.68
2000	18.58	25.69	2.87	13.43	0.64	1.35	33.18	20.57	0.71
2100	18.20	25.57	2.91	13.61	0.66	1.35	34.09	20.82	0.63
2200	17.85	25.36	2.94	13.76	0.68	1.35	34.34	20.68	0.65
2300	17.50	25.26	2.98	13.92	0.70	1.35	34.48	20.69	0.72
2400	17.17	25.14	3.00	14.03	0.72	1.35	34.40	20.81	0.64
2500	16.85	25.01	3.02	14.18	0.74	1.35	33.96	20.73	0.66
2600	16.54	24.89	3.05	14.29	0.76	1.34	33.62	20.78	0.72
2700	16.25	24.72	3.08	14.37	0.78	1.34	33.99	20.74	0.78
2800	15.96	24.62	3.11	14.45	0.80	1.34	32.34	20.80	0.76
2900	15.69	24.50	3.14	14.47	0.81	1.34	34.26	20.92	0.83
3000	15.41	24.37	3.17	14.53	0.83	1.34	34.92	20.79	0.68
3100	15.15	24.22	3.18	14.59	0.84	1.34	33.32	20.82	0.84
3200	14.89	24.13	3.21	14.66	0.86	1.33	34.94	20.92	0.93
3300	14.65	24.02	3.23	14.74	0.88	1.33	33.75	20.96	0.87
3400	14.41	23.88	3.25	14.84	0.90	1.33	34.44	20.97	0.89
3500	14.18	23.75	3.25	14.88	0.91	1.33	34.48	20.99	0.88
3600	13.95	23.64	3.26	14.93	0.92	1.33	33.14	21.06	0.95
3700	13.72	23.53	3.27	14.98	0.94	1.33	33.63	20.83	0.91
3800	13.50	23.39	3.27	14.95	0.95	1.33	34.47	20.88	0.96
3900	13.28	23.28	3.27	14.95	0.96	1.33	34.55	20.84	0.98
4000	13.07	23.21	3.25	14.93	0.97	1.33	34.12	20.72	1.04
4100	12.85	23.07	3.24	14.89	0.98	1.33	34.36	20.98	1.10
4200	12.65	22.97	3.21	14.82	0.99	1.33	34.91	20.90	1.16
4300	12.43	22.89	3.19	14.72	1.00	1.33	34.25	20.88	1.04
4400	12.23	22.79	3.16	14.66	1.01	1.33	33.93	20.99	1.07
4500	12.02	22.69	3.14	14.54	1.02	1.33	34.28	20.73	1.08
4600	11.81	22.61	3.10	14.40	1.03	1.33	34.04	20.91	1.26
4700	11.60	22.53	3.06	14.26	1.04	1.34	34.43	20.84	1.20
4800	11.40	22.46	3.03	14.11	1.05	1.34	33.59	20.78	1.27
4900	11.19	22.36	2.99	13.91	1.05	1.34	34.73	20.92	1.47
5000	10.98	22.29	2.95	13.70	1.06	1.34	34.30	20.94	1.29
5100	10.77	22.24	2.91	13.52	1.07	1.34	33.44	20.87	1.36
5200	10.58	22.18	2.85	13.35	1.07	1.34	34.08	20.78	1.22
5300	10.37	22.13	2.83	13.17	1.08	1.34	33.92	20.79	1.53
5400	10.18	22.02	2.77	13.05	1.08	1.35	34.15	20.66	1.53
5500	9.98	21.99	2.74	12.93	1.09	1.35	34.06	20.46	1.63
5600	9.80	21.91	2.70	12.78	1.10	1.35	33.92	20.73	1.49
5700	9.60	21.84	2.67	12.66	1.11	1.35	34.75	20.34	1.50
5800	9.42	21.79	2.63	12.51	1.11	1.35	33.91	20.47	1.56
5900	9.23	21.72	2.59	12.31	1.11	1.35	33.61	20.62	1.75
6000	9.04	21.67	2.55	12.13	1.12	1.35	34.52	20.34	1.53



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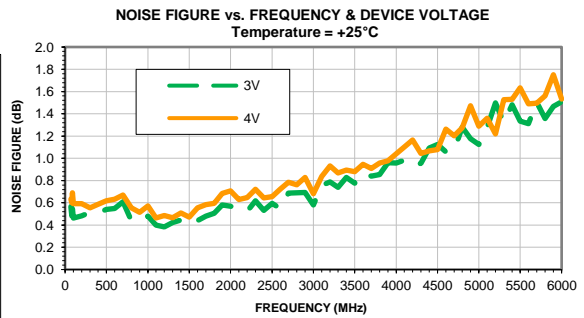
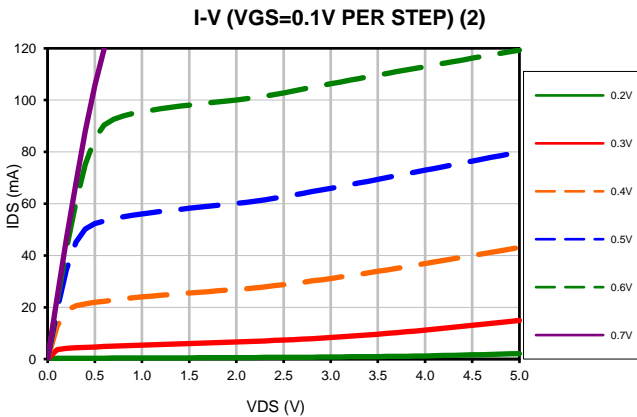
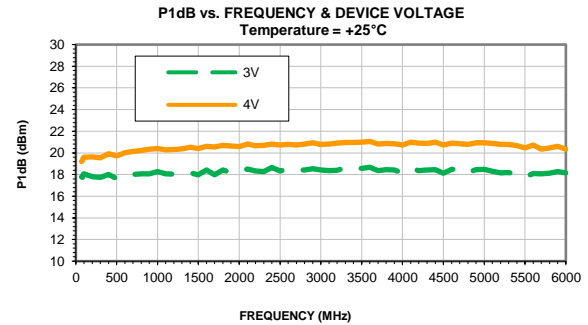
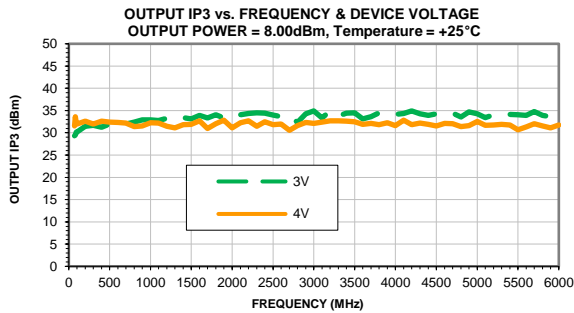
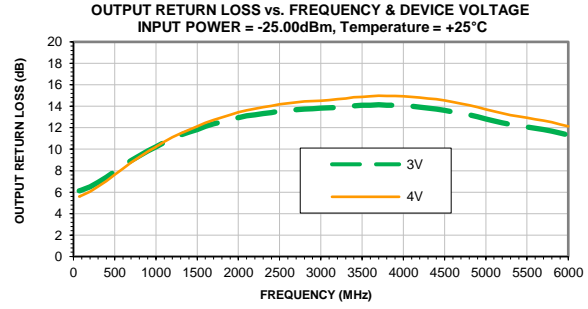
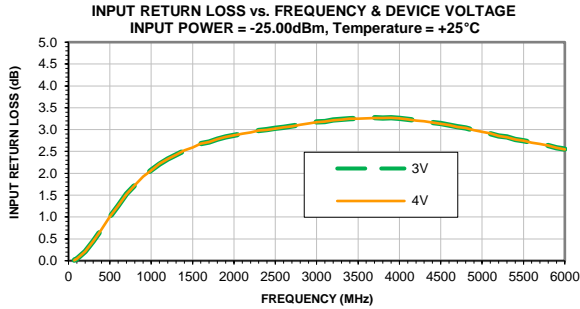
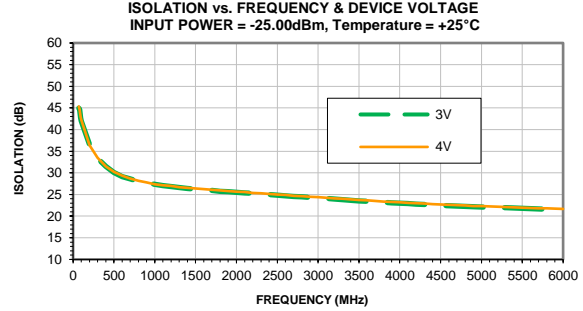
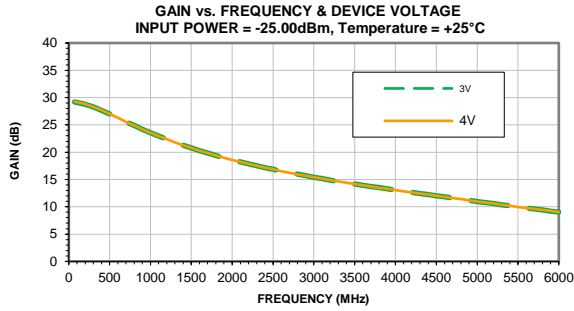


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IF/RF MICROWAVE COMPONENTS



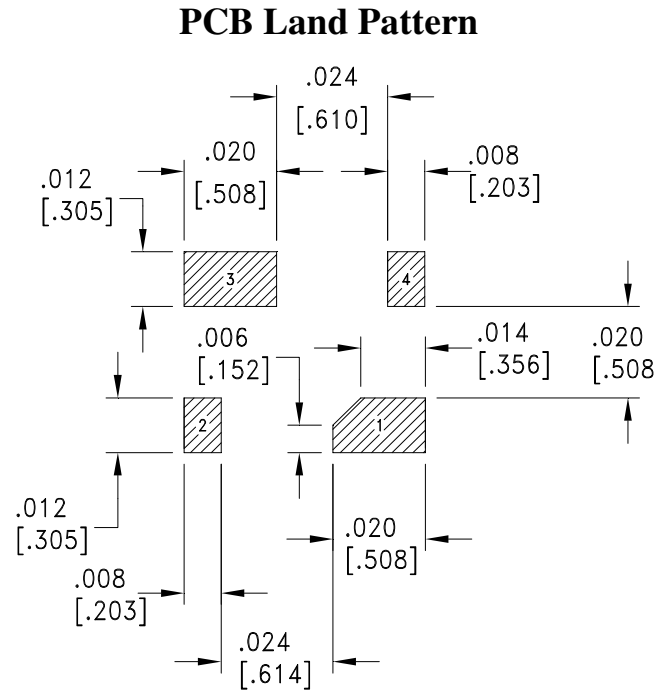
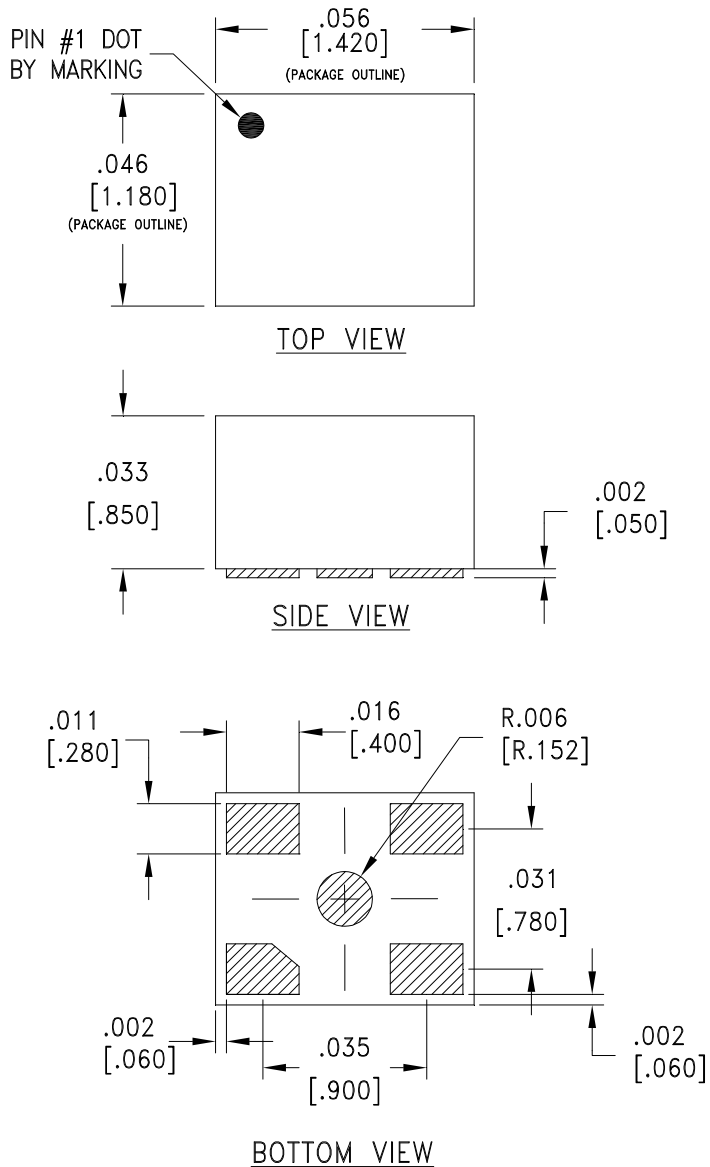
## Typical Performance Curves



(1) Includes test board loss

## Outline Dimensions

TE2769



Suggested Layout,  
Tolerance to be within  $\pm .002$

Weight: .0047 grams

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .01$ ; 3 Pl.  $\pm .005$

### Notes:

1. Case material: Plastic.
2. Termination finish:

For RoHS Case Styles: Matte-Tin plate.



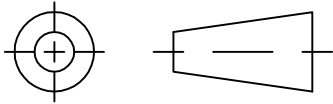
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RF/IF MICROWAVE COMPONENTS

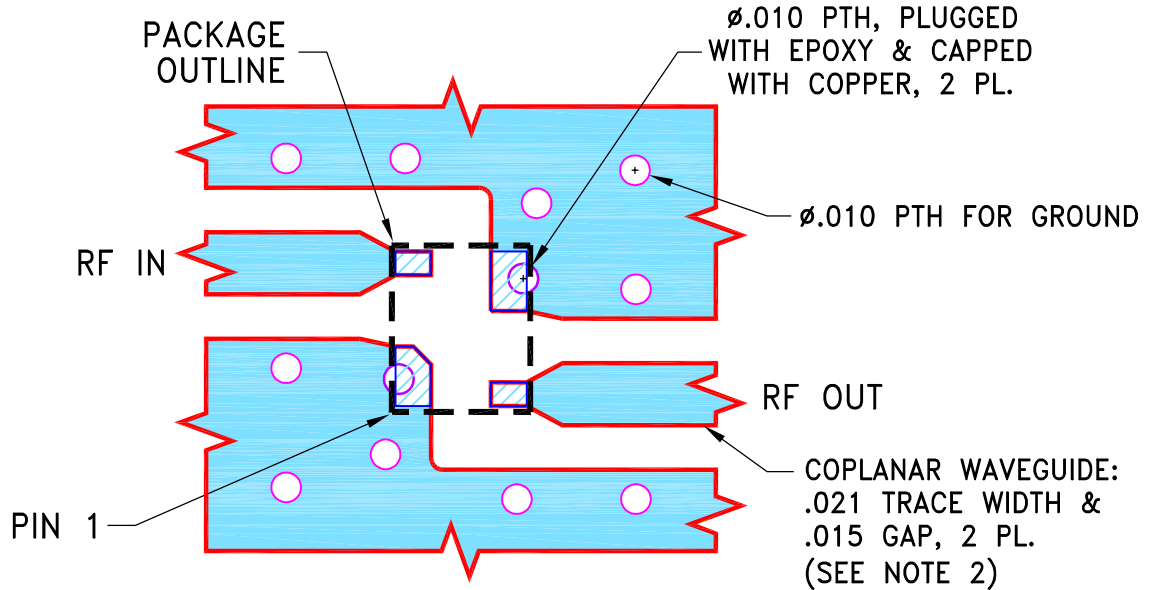
THIRD ANGLE PROJECTION



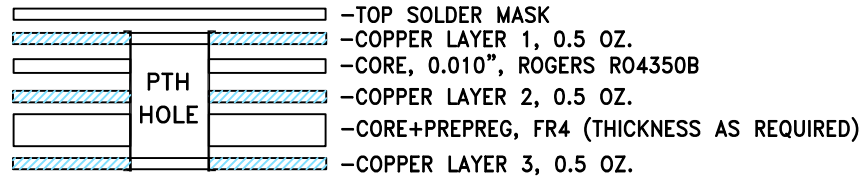
REVISIONS

REV OR	ECN No.	DESCRIPTION	DATE	DR	AUTH
	ECO-001106	NEW RELEASE	12/18/19	ITG	GH

**SUGGESTED MOUNTING CONFIGURATION  
FOR TE2769 CASE STYLE**



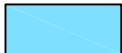
**STACK-UP DIAGRAM**



1. TOTAL FINISHED THICKNESS 0.065" ± 10%.
2. PTH HOLES PRESENT FROM COPPER LAYER 1 TO 3.

**NOTES:**

1. PCB IS MULTILAYER PCB, SEE STACK-UP DIAGRAM.
2. TRACE WIDTH & GAP ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010±.001". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.
3. UNIT FOOT PRINT IS OPTIMIZED FOR PERFORMANCE AND IS DIFFERENT FROM CASE STYLE TE2769 RECOMMENDATIONS.
4. LAYERS 2 & 3 OF THE PCB ARE CONTINUOUS GROUND PLANE.



DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).



DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

UNLESS OTHERWISE SPECIFIED	INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN ITG	12/18/19
TOLERANCES ON:	CHECKED GF	12/18/19
2 PL DECIMALS ±	APPROVED GH	12/18/19
3 PL DECIMALS ± .005		
ANGLES ±		
FRACTIONS ±		



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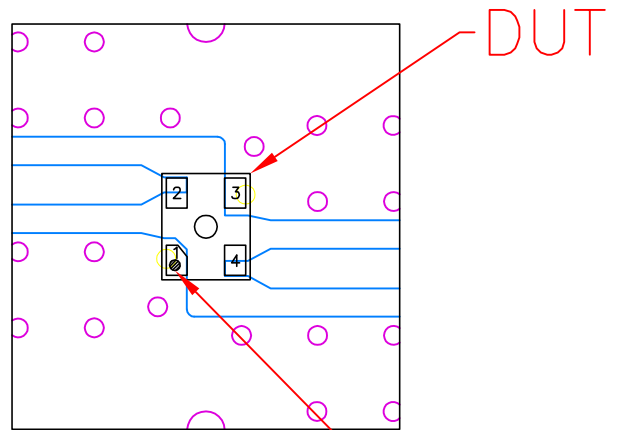
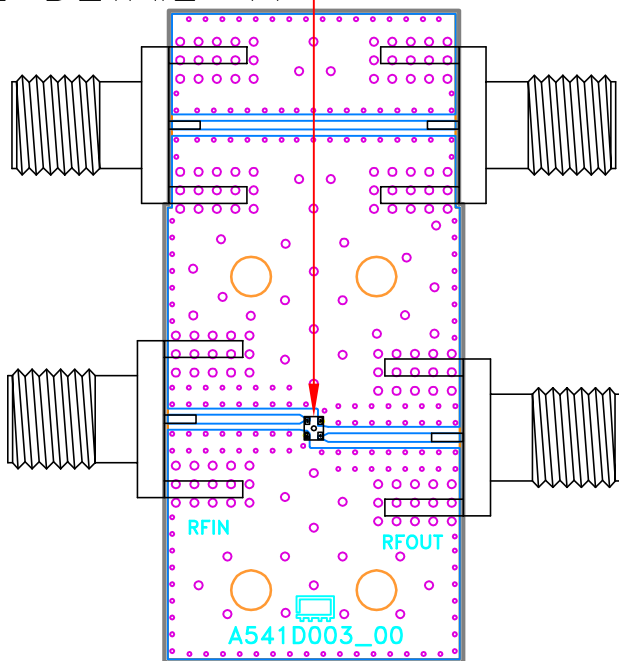
**PL, TE2769, TB-TAVI-541+**

SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-665	REV: OR
FILE: 98PL665	SCALE: 15:1	SHEET: 1 OF 1	

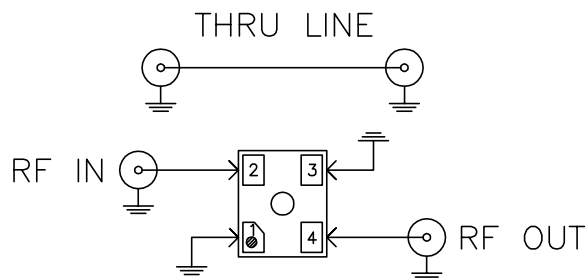
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# Evaluation Board and Circuit

SEE DETAIL "A"



DETAIL "A"  
(SCALE 5:1)




SCHEMATIC DIAGRAM  
(SCALE 5:1)

Function	Pad
RF IN	2
RF OUT	4
GND	1,3

## Notes:

1. 50 Ohm SMA Female Connectors.
2. PCB Material: Roger R04350B or equivalent,  
Dielectric constant=3.5, Thickness=0.01 inch

 **Mini-Circuits®**

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-45° to 85°C or -40° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-65° to 150° C Ambient Environment	Individual Model Data Sheet
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Mechanical Shock	1.5Kg, 0.5 ms, 5 shock pulses, Y1 direction only	MIL-STD-883, Method 2002, Condition B, except Y1 direction only
Vibration (Variable Frequency)	50g peak	MIL-STD-883, Method 2007, Condition B
Autoclave	15 psig, 100% RH, 121°C, 96 hours	JESD22-A102, Condition C
HAST	130°C, 85% RH, 96 hours	JESD22-A110
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Solder Reflow Heat	Sn-Pb Eutetic Process: 240°C peak Pb-Free Process: 260°C peak	J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1
Moisture Sensitivity: Level 1	Bake at 125°C for 24 hours Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 260°C peak	J-STD-020
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether +	MIL-STD-202, Method 215



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

<b>Specification</b>	<b>Test/Inspection Condition</b>	<b>Reference/Spec</b>
	monoethanolamine at 63°C to 70°C	