ULTRA LOW NOISE, MEDIUM CURRENT

D-PHEMT Transistor

TAV1-331+

50Ω 10 to 4000 MHz

THE BIG DEAL

- Low Noise Figure, 0.6 dB typ. at 300 MHz
- High Gain, 24.1 dB typ. at 300 MHz
- High Output IP3, +31.8 dBm typ. at 300 MHz
- Output Power at 1dB comp., +20.1 dBm typ. at 300 MHz
- Low Current, 60mA
- External biasing and matching required
- May be used as a replacement [a,b] for Broadcom ATF-331M4



Generic photo used for illustration purposes only

CASE STYLE: TE2769

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

APPLICATIONS

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

PRODUCT OVERVIEW

Mini-Circuits' TAV1-331+ is a MMIC D-PHEMT* transistor with an operating frequency range from 10 to 4000 MHz. This model combines high gain with extremely low noise figure, resulting in lower overall system noise. Low NF and IP3 performance make it an ideal choice for sensitive receivers in communications systems. Manufactured using highly repeatable D-PHEMT* technology, the unit comes housed in a tiny 1.4x1.2mm MCLP package. This model requires external biasing and matching.

KEY FEATURES

Feature	Advantages
Wideband, 10 to 4000 MHz	A single device covers many wireless communications bands including cellular, ISM, GSM, WCDMA, WiMax, WLAN, and more.
High IP3 vs. DC power consumption • +31.8 dBm at 300 MHz • +37.3 dBm at 4000 MHz	The TAV1-331+ matches industry leading IP3 performance relative to device size and power consumption. Enhanced linearity over a broad frequency range makes the device ideal for use in: • Driver amplifiers for complex waveform up converter paths • Drivers in linearized transmit systems
Combines high gain (24.1 dB) with very low Noise Figure (0.6 dB)	The unique combination of high gain and low Noise Figure results in lower overall system noise.

* Depletion mode Pseudomorphic High Electron Mobility Transistor.

ELECTRICAL SPECIFICATIONS AT T_{AMB}=25°C, FREQUENCY 10 TO 4000 MHZ

Symbol	Parameter	Condition		Min.	Typ.	Max.	Units
DC Specifications							
V_{GS}	Operational Gate Voltage	V_{DS}=4V, I_{DS}=60 mA		-0.96	-0.69	-0.51	V
V_p	Pinch-off Voltage	V_{DS}=1.5V, I_{DS}= 10% of Idss			-0.81		V
I_{DSS}	Saturated Drain Current	V_{DS}=4V, V_{GS}=0 V			228		mA
G_M	Transconductance	V_{DS}=4V, $_{Gm}$=Δ I_{DS}/ΔV_{GS}			282		mS
I_{GDO}	Gate to Drain Leakage Current	V_{GD}=-5V				1000	uA
I_{GSS}	Gate leakage Current	V_{GD}=V_{GS}=-4V				600	µA
Specifications, Z0=50 Ohms (Figure 1)*							
NF	Noise Figure	V_{DS}=4V, I_{DS}=60 mA	f=50 MHz		0.9		dB
			f=300 MHz		0.6		
			f=900 MHz		0.5		
			f=2000 MHz		0.6	0.8	
			f=4000 MHz		1.0		
Gain	Gain	V_{DS}=4V, I_{DS}=60 mA	f=10 MHz		24.6		dB
			f=300 MHz		24.1		
			f=900 MHz		21.6		
			f=2000 MHz	13.9	17.0	18.3	
			f=4000 MHz		12.0		
OIP3	Output IP3	V_{DS}=4V, I_{DS}=60 mA	f=10 MHz		31.7		dBm
			f=300 MHz		31.8		
			f=900 MHz		32.9		
			f=2000 MHz		34.6		
			f=4000 MHz		37.3		
P1dB	Power output at 1 dB Compression	V_{DS}=4V, I_{DS}=60 mA	f=10 MHz		19.6		dBm
			f=300 MHz		20.1		
			f=900 MHz	18.0	20.4		
			f=2000 MHz		21.3		
			f=4000 MHz		21.3		
Θ_{JC}	Thermal Resistance				106		°C/W

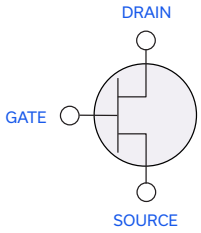
*Tested on Mini-Circuits test board TB-TAVI-331+

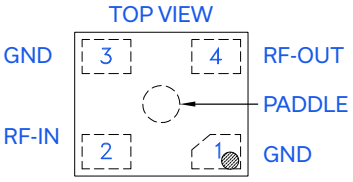
MAXIMUM RATINGS(1)

Symbol	Parameter	Max.	Units
V_{DS}	Drain-Source Voltage[2]	5	V
V_{GS}	Gate-Source Voltage[2]	-5	V
V_{GD}	Gate-Drain Voltage[2]	-5	V
I_{DS}	Drain Current[2]	149	mA
P_{DISS}	Total Dissipated Power	400	mW
P_{IN}	RF Input Power	20	dBm
T_{CH}	Channel Temperature	150	°C
T_{OP}	Operating Temperature	-40 to 85	°C
T_{STD}	Storage Temperature	-65 to 150	°C

(1) Operation of this device above any one of these parameters may cause permanent damage.
(2) Assumes DC quiescent conditions, Vgs = -0.51 V, Vds = 4 V.

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.

A. Note: Suitability for model replacement within a particular system must be determined by and is solely the responsibility of the customer based on, among other things, electrical performance criteria, stimulus conditions, and application, compatibility with other components and environmental conditions and stresses
B. The Broadcom ATF-331M4 part number is used for identification and comparison purposes only.

CHARACTERIZATION TEST CIRCUIT

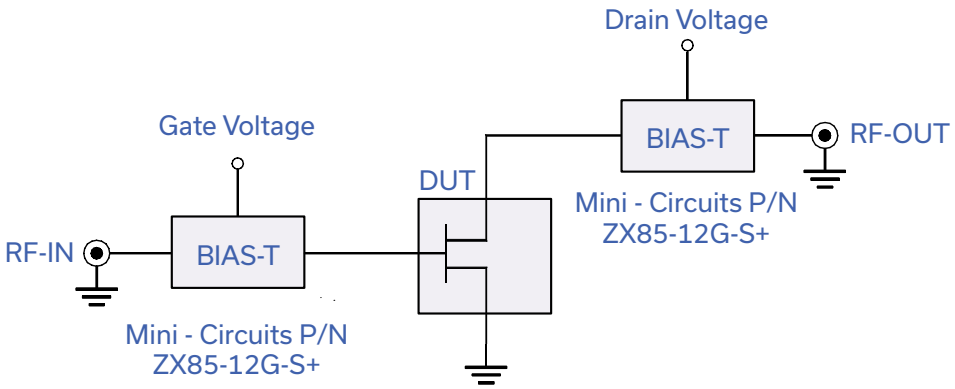


Fig 1. Block Diagram of Test Circuit used for characterization. (DUT soldered on Mini-Circuits Test Board TB-TAV1-331+)

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

Conditions:
1. Drain voltage (with reference to source, VDS)= 4V as shown.
2. Gate Voltage (with reference to source, VGS) is set to obtain desired Drain-Source current (IDS) as shown in graphs or 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.

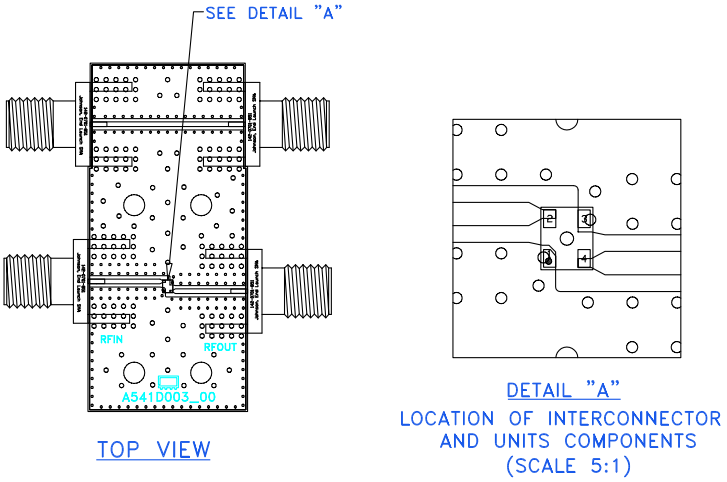
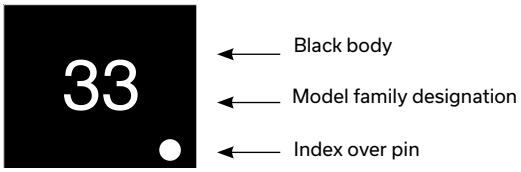


Fig 2. Test Board used for characterization, Mini-Circuits P/N TB-TAV1-331+ (Material: Rogers R04350B, Thickness: 0.01")

PRODUCT MARKING



Marking may contain other features or characters for internal lot control

D-PHEMT Transistor TAV1-331+

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	PL-627
Evaluation Board	TB-TAV1-331+
Environmental Ratings	ENV08T2

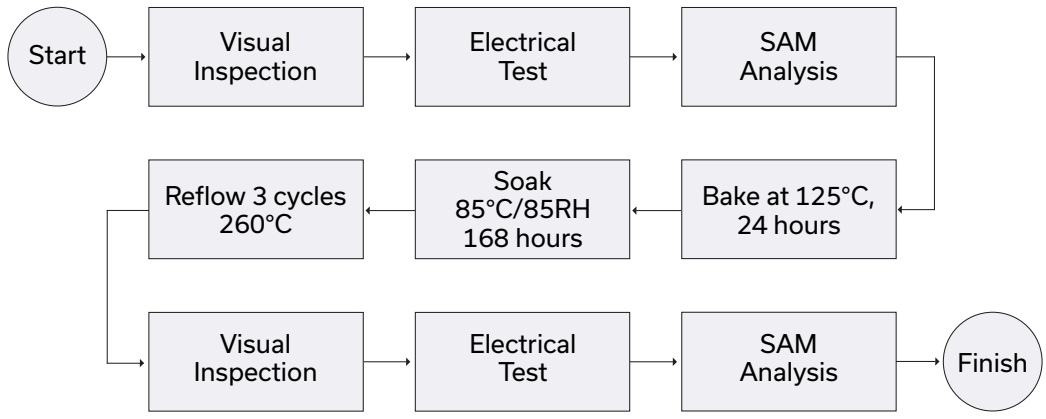
ESD RATING

Human Body Model (HBM): Class 0 (<250V) 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

ENTEGRECİ

Bu belge www.entegreci.com üzerinden sunulmaktadır.

Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

www.entegreci.com

Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

www.entegreci.com | **destek@entegreci.com** | **0850 305 90 34**

Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

Bu sayfa Entegreci tarafından eklenmiştir. Belgenin önceki sayfaları asıl yayıncısına aittir ve içeriği değiştirilmemiştir; en güncel sürüm için belgenin yayıncısına başvurun.