Pseudomorphic HEMT. ATF-38143 Datasheet

ATF-38143 HEMT. Datasheet pdf. Equivalent

Part	**ATF-38143**
Description	**Low Noise Pseudomorphic HEMT**
Feature	ATF-38143 Low Noise Pseudomorphic HEMT i n a Surface Mount Plastic Package Data Sheet Description Avago Technologies● ●s ATF-38143 is a high dynamic range, l ow noise, PHEMT housed in a 4-lead SC-7 0 (SOT343) surface mount plastic packag e. Based on its featured performance, A TF-38143 is suitable for applications i n cellular and PCS handsets, LEO system s, MMDS, and other s.
Manufacture	AVAGO
Datasheet	Download ATF-38143 Datasheet

ATF-38143

Low Noise Pseudomorphic HEMT

in a Surface Mount Plastic Package

Data Sheet

Description

Avago Technologies's ATF-38143 is a high dynamic range, low noise, PHEMT housed in a 4-lead SC-70 (SOT-343) surface mount plastic package.

Based on its featured performance, ATF-38143 is suitable for applications in cellular and PCS handsets, LEO systems, MMDS, and other systems requiring super low noise figure with good intercept in the 450 MHz to 10 GHz frequency range.

Surface Mount Package SOT-343

Features

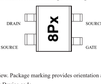
- Lead-free Option Available
- Low Noise Figure
- Excellent Uniformity in Product Specifications
- Low Cost Surface Mount Small Plastic Package SOT-343 (4 lead SC-70)
- Tape-and-Reel Packaging Option Available

Specifications

1.9 GHz, 2 V, 10 mA (Typ.)

- 0.4 dB Noise Figure
- 16 dB Associated Gain
- 12.0 dBm Output Power at 1 dB Gain Compression
- 22.0 dBm Output 3rd Order Intercept

Pin Connections and Package Marking



Note:
Top View. Package marking provides orientation and identification.
"8P" = Device code
"x" = Date code character.
A new character is assigned for each month, year.

Applications

- Low Noise Amplifier for Cellular/PCS Handsets
- LNA for WLAN, WLL/RLL, LEO, and MMDS Applications
- General Purpose Discrete PHEMT for Other Ultra Low Noise Applications

Attention: Observe precautions for handling electrostatic sensitive devices.
ESD Machine Model (Class A)
ESD Human Body Model (Class 1)
Refer to Avago Application Note A004R: Electrostatic Discharge Damage and Control.

ATF-38143 Absolute Maximum Ratings[1]

Symbol	Parameter	Units	Absolute Maximum
V_{DS}	Drain – Source Voltage[2]	V	4.5
V_{GS}	Gate – Source Voltage	V	-4
V_{GD}	Gate Drain Voltage	V	-4
I_{DS}	Drain Current	mA	I_{dss}
P_{diss}	Total Power Dissipation[3]	mW	580
$P_{in,max}$	RF Input Power	dBm	17
T_{ch}	Channel Temperature	°C	160
T_{stg}	Storage Temperature	°C	-65 to 160
θ_{jc}	Thermal Resistance[3]	°C/W	165

Notes:
1. Operation of this device above any one of these parameters may cause permanent damage.
2. Tchannel = 150°C.
3. Thermal resistance measured using 150°C Liquid Crystal Measurement method.

Product Consistency Distribution Charts

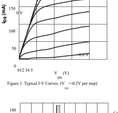


Figure 1. Typical I-V Curves. (V_GS = 0.2V per step)

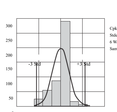


Figure 2. OIP3 @ 2 GHz, 2 V, 10 mA. LSL=18.5, Nominal=21.99, USL=26.0

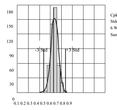


Figure 3. NF @ 2 GHz, 2 V, 10 mA. LSL=0, Nominal=0.44, USL=0.85

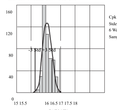


Figure 4. Gain @ 2 GHz, 2 V, 10 mA. LSL=15.0, Nominal=16.08, USL=18.0

Note:
Distribution data sample size is 450 samples taken from 6 different wafers. Future wafers allocated to this product may have nominal values anywhere within the upper and lower spec limits. Measurements made on production test board. This circuit represents a trade-off between an optimal noise match and a realizable match based on production test requirements. Circuit losses have been de-embedded from actual measurements.

ATF-38143 Electrical Specifications T_A = 25°C, RF parameters measured in a test circuit for a typical device

Symbol	Parameters and Test Conditions		Units	Min.	Typ.[2]	Max.
I_{DSS}[1]	Saturated Drain Current	V_{DS} = 1.5 V, V_{GS} = 0 V	mA	90	118	145
V_P[1]	Pinchoff Voltage	V_{DS} = 1.5 V, I_{DS} = 10% of I_{DSS}	V	-0.65	-0.5	-0.35
I_{GSO}	Quiescent Bias Current	V_{DS} = -0.54 V, V_{GS} = 2 V	mA		10	
g_m[1]	Transconductance	V_{DS} = 1.5 V, g_m = I_{DSS} / V_P	mmho	180	230	
I_{GDO}	Gate to Drain Leakage Current	V_{GD} = -5 V	µA			500
I_{GSS}	Gate Leakage Current	V_{GS} = V_{GD} = -4 V	µA		30	300
NF	Noise Figure	V_{DS} = 2 V, I_{DS} = 5 mA, f = 2 GHz	dB	0.6		
		V_{DS} = 2 V, I_{DS} = 10 mA, f = 2 GHz	dB		0.4	0.85
		V_{DS} = 2 V, I_{DS} = 20 mA, f = 2 GHz	dB		0.3	
		V_{DS} = 2 V, I_{DS} = 5 mA, f = 900 MHz	dB	0.6		
		V_{DS} = 2 V, I_{DS} = 10 mA, f = 900 MHz	dB		0.4	
		V_{DS} = 2 V, I_{DS} = 20 mA, f = 900 MHz	dB		0.3	
G[1]	Associated Gain	V_{DS} = 2 V, I_{DS} = 5 mA, f = 2 GHz	dB	15.3		
		V_{DS} = 2 V, I_{DS} = 10 mA, f = 2 GHz	dB	15	16.0	18
		V_{DS} = 2 V, I_{DS} = 20 mA, f = 2 GHz	dB		17.0	
		V_{DS} = 2 V, I_{DS} = 5 mA, f = 900 MHz	dB	17.0		
		V_{DS} = 2 V, I_{DS} = 10 mA, f = 900 MHz	dB		19.0	
		V_{DS} = 2 V, I_{DS} = 20 mA, f = 900 MHz	dB		20.5	
OIP3	Output 3rd Order Intercept Point[1]	V_{DS} = 2 V, I_{DS} = 10 mA, f = 2 GHz	dBm	18.5	22.0	
		V_{DS} = 2 V, I_{DS} = 10 mA, f = 900 MHz	dBm		22.0	
IIP3	Input 3rd Order Intercept Point[1]	V_{DS} = 2 V, I_{DS} = 10 mA, f = 2 GHz	dBm		6.0	
		V_{DS} = 2 V, I_{DS} = 10 mA, f = 900 MHz	dBm		3.0	
P_{1dB}	1 dB Compressed Compressed Power[3]	V_{DS} = 2 V, I_{DS} = 10 mA, f = 2 GHz	dBm		12.0	
		V_{DS} = 2 V, I_{DS} = 10 mA, f = 900 MHz	dBm		12.0	

Notes:
1. Guaranteed at wafer probe level.
2. Typical value determined from a sample size of 450 parts from 6 wafers.
3. Measurements obtained using production test board described in Figure 5.

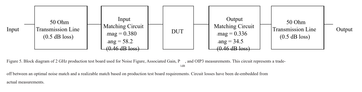


Figure 5. Block diagram of 2 GHz production test board used for Noise Figure, Associated Gain, P_{1dB}, and OIP3 measurements. This circuit represents a trade-off between an optimal noise match and a realizable match based on production test board requirements. Circuit losses have been de-embedded from actual measurements.

Recommended third-party ATF-38143 Datasheet