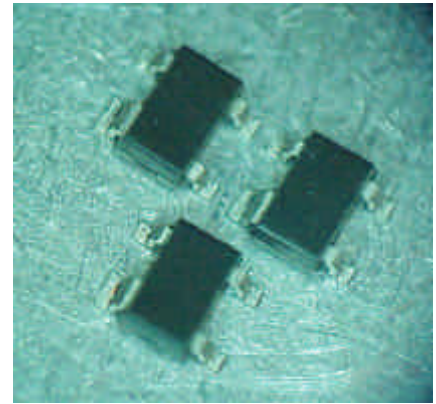


**FEATURES**

- ◆ 0.5 dB Noise Figure at 2 GHz
- ◆ 21 dBm P-1dB 2 GHz
- ◆ 17 dB Power Gain at 2 GHz
- ◆ 33 dBm IP3 at 2 GHz
- ◆ 45% Power-Added-Efficiency


**DESCRIPTION AND APPLICATIONS**

The FP750SOT343 is a packaged AlGaAs/InGaAs/AlGaAs pseudomorphic high electron mobility transistor (pHEMT) intended for applications requiring low noise figure, medium output power and/or high dynamic range. It utilizes a  $0.25\ \mu\text{m} \times 750\ \mu\text{m}$  Schottky barrier gate, defined by electron-beam photolithography. The FP750's active areas are passivated with  $\text{Si}_3\text{N}_4$ , and the SOT343 (also known as SC-70) package is ideal for low-cost, high-performance applications that require a surface-mount package.

The FP750SOT343 is designed for commercial systems for use in low noise amplifiers and oscillators operating over the RF and Microwave frequency ranges. The low noise figure makes it appropriate for use in receivers in WLL/RLL, WLAN, and GPS. This device is also suitable for PCS and GSM base station front-ends.

**ELECTRICAL SPECIFICATIONS @  $T_{\text{Ambient}} = 25^\circ\text{C}$** 

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Saturated Drain-Source Current	$I_{\text{DSS}}$	$V_{\text{DS}} = 2\ \text{V}; V_{\text{GS}} = 0\ \text{V}$	180	220	265	mA
Power at 1-dB Compression	P-1dB	$f=2\text{GHz}; V_{\text{DS}} = 3.3\ \text{V}; I_{\text{DS}} = 110\text{mA}$	20	21		dBm
Power Gain at 1-dB Compression	G-1dB	$f=2\text{GHz}; V_{\text{DS}} = 3.3\ \text{V}; I_{\text{DS}} = 110\text{mA}$	16	17		dB
Power-Added Efficiency	PAE	$f=2\text{GHz}; V_{\text{DS}} = 3.3\ \text{V}; I_{\text{DS}} = 110\text{mA}; P_{\text{OUT}} = 21\ \text{dBm}$		45		%
Noise Figure	NF	$f=2\text{GHz}; V_{\text{DS}} = 3.3\ \text{V}; 40\text{mA}$		0.4		dB
		$f=2\text{GHz}; V_{\text{DS}} = 3.3\ \text{V}; I_{\text{DS}} = 60\text{mA}$		0.5		dB
		$f=2\text{GHz}; V_{\text{DS}} = 3.3\ \text{V}; 110\text{mA}$		0.7		dB
Output Third-Order Intercept Point	IP3	$V_{\text{DS}} = 3.3\ \text{V}; I_{\text{DS}} = 110\text{mA}$		33		dBm
Transconductance	$G_{\text{M}}$	$V_{\text{DS}} = 2\ \text{V}; V_{\text{GS}} = 0\ \text{V}$	170	220		mS
Gate-Source Leakage Current	$I_{\text{GSO}}$	$V_{\text{GS}} = -5\ \text{V}$		5	35	$\mu\text{A}$
Pinch-Off Voltage	$V_{\text{P}}$	$V_{\text{DS}} = 2\ \text{V}; I_{\text{DS}} = 2\ \text{mA}$		-1.2		V
Gate-Source Breakdown Voltage Magnitude	$ V_{\text{BDGS}} $	$I_{\text{GS}} = 2\ \text{mA}$	10	12		V
Gate-Drain Breakdown Voltage Magnitude	$ V_{\text{BDGD}} $	$I_{\text{GD}} = 2\ \text{mA}$	10	13		V



# PRELIMINARY DATA SHEET **FP750SOT343**

PACKAGED LOW NOISE, MEDIUM POWER PHEMT

## • ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Test Conditions	Min	Max	Units
Drain-Source Voltage	$V_{DS}$	$T_{Ambient} = 22 \pm 3 \text{ }^{\circ}\text{C}$		5	V
Gate-Source Voltage	$V_{GS}$	$T_{Ambient} = 22 \pm 3 \text{ }^{\circ}\text{C}$		-3	V
Drain-Source Current	$I_{DS}$	$T_{Ambient} = 22 \pm 3 \text{ }^{\circ}\text{C}$		$I_{DSS}$	mA
Gate Current	$I_G$	$T_{Ambient} = 22 \pm 3 \text{ }^{\circ}\text{C}$		7.5	mA
RF Input Power	$P_{IN}$	$T_{Ambient} = 22 \pm 3 \text{ }^{\circ}\text{C}$		175	mW
Channel Operating Temperature	$T_{CH}$	$T_{Ambient} = 22 \pm 3 \text{ }^{\circ}\text{C}$		175	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	—	-65	175	$^{\circ}\text{C}$
Total Power Dissipation	$P_{TOT}$	$T_{Ambient} = 22 \pm 3 \text{ }^{\circ}\text{C}$		1.0	W

### Notes:

- Operating conditions that exceed the Absolute Maximum Ratings could result in permanent damage to the device.
- Power Dissipation defined as:  $P_{TOT} \equiv (P_{DC} + P_{IN}) - P_{OUT}$ , where  
 $P_{DC}$ : DC Bias Power  
 $P_{IN}$ : RF Input Power  
 $P_{OUT}$ : RF Output Power
- Absolute Maximum Power Dissipation to be de-rated as follows above 25 $^{\circ}\text{C}$ :  
 $P_{TOT} = 1.0\text{W} - (0.007\text{W}/^{\circ}\text{C}) \times T_{PACK}$   
where  $T_{PACK}$  = *source tab lead temperature*.
- This PHEMT is susceptible to damage from Electrostatic Discharge. Proper precautions should be used when handling these devices.

## • HANDLING PRECAUTIONS

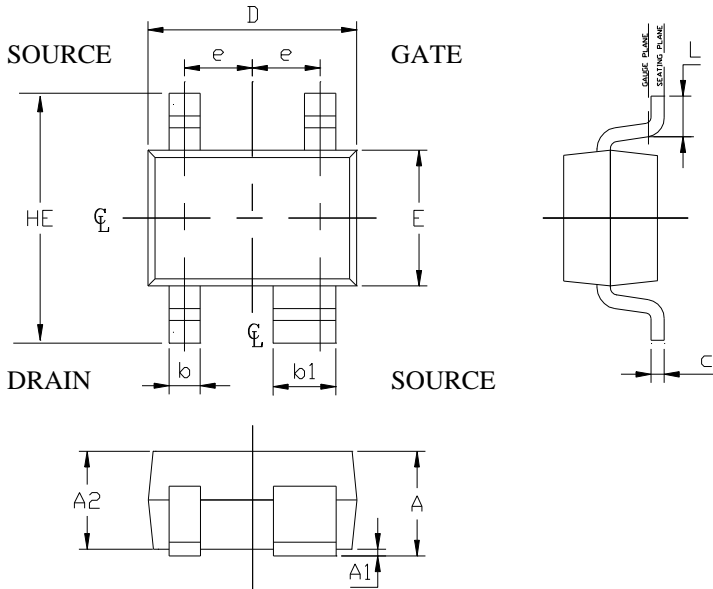
To avoid damage to the devices care should be exercised during handling. Proper Electrostatic Discharge (ESD) precautions should be observed at all stages of storage, handling, assembly, and testing. These devices should be treated as Class 1A (0-500 V). Further information on ESD control measures can be found in MIL-STD-1686 and MIL-HDBK-263.

## • APPLICATIONS NOTES & DESIGN DATA

Applications Notes are available from your local Filtronic Sales Representative or directly from the factory. Complete design data, including S-parameters, noise data, and large-signal models are available on the Filtronic web site.

**PACKAGE OUTLINE**

(dimensions in mm)



SYMBOL	MIN	MAX
E	1.15	1.35
D	1.85	2.25
HE	1.80	2.40
A	0.80	1.10
A2	0.80	1.00
A1	0.00	0.10
e	0.65 BSC	
b	0.25	0.40
b1	0.55	0.70
c	0.10	0.18
L	0.26	0.46

All information and specifications are subject to change without notice.