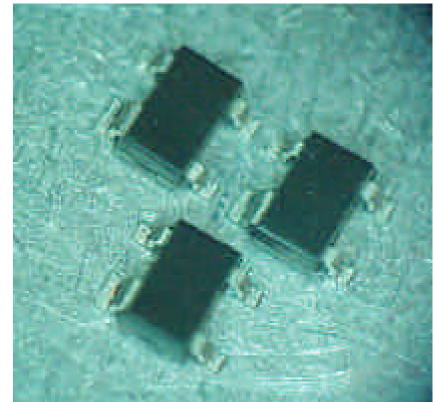
Filtronic

PRELIMINARY DATA SHEET

FP750SOT343

PACKAGED LOW NOISE, MEDIUM POWER PHEMT



- 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 µm x 750 µm Schottky barrier gate, defined by electron-beam photolithography. The FP750's active areas are passivated with Si_3N_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 @ $T_{Ambient}$ = 25°C

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

• ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Test Conditions	Min	Max	Units
Drain-Source Voltage	V_{DS}	$T_{Ambient} = 22 \pm 3$ °C		5	V
Gate-Source Voltage	V_{GS}	$T_{Ambient} = 22 \pm 3$ °C		-3	V
Drain-Source Current	I_{DS}	$T_{Ambient} = 22 \pm 3$ °C		I_{DSS}	mA
Gate Current	I_G	$T_{Ambient} = 22 \pm 3$ °C		7.5	mA
RF Input Power	P_{IN}	$T_{Ambient} = 22 \pm 3$ °C		175	mW
Channel Operating Temperature	T_{CH}	$T_{Ambient} = 22 \pm 3$ °C		175	ºC
Storage Temperature	T_{STG}	—	-65	175	ºC
Total Power Dissipation	P_{TOT}	$T_{Ambient} = 22 \pm 3$ °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°C:
  $P_{TOT} = 1.0W - (0.007W/°C) \times T_{PACK}$
  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.

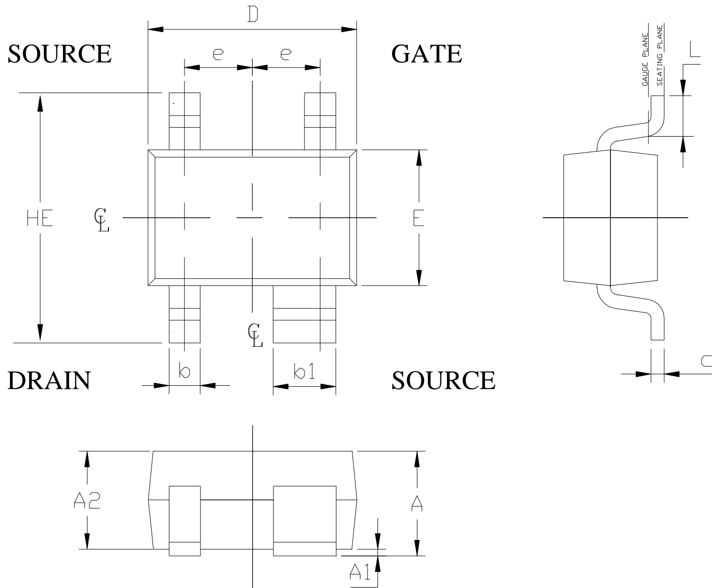
• HANDLING PRECAUTIONS

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.