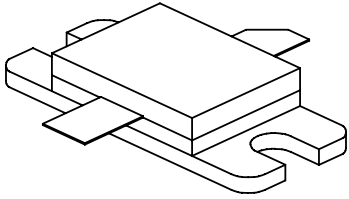





0150SC-1250M

1250Watts, 125 Volts, Class AB
150 to 160 MHz
Silicon Carbide SIT

PRELIMINARY SPECIFICATION

<p>GENERAL DESCRIPTION</p> <p>The 0150SC-1250M is a Common Gate N-Channel Class AB SILICON CARBIDE STATIC INDUCTION TRANSISTOR (SIT) capable of providing 1250 Watts minimum of RF power from 150 to 160 MHz. The transistor is designed for use in High Power Amplifiers supporting applications such as VHF Weather Radar and Long Range Tracking Radar. The device is the first in a series of High Power Silicon Carbide Transistors from Microsemi PPG.</p>	<p>CASE OUTLINE 55KT FET (Common Gate) See outline drawing</p> 										
<p>ABSOLUTE MAXIMUM RATINGS</p> <p>Voltage and Current</p> <table border="0"> <tr> <td>Drain-Source (V_{DSS})</td> <td>250 V</td> </tr> <tr> <td>Gate-Source (V_{GS})</td> <td>-1V</td> </tr> <tr> <td>Drain Current (I_{dg})</td> <td>35A</td> </tr> </table> <p>Temperatures</p> <table border="0"> <tr> <td>Storage Temperature</td> <td>-65 to +150°C</td> </tr> <tr> <td>Operating Junction Temperature</td> <td>+250°C</td> </tr> </table> 	Drain-Source (V_{DSS})	250 V	Gate-Source (V_{GS})	-1V	Drain Current (I_{dg})	35A	Storage Temperature	-65 to +150°C	Operating Junction Temperature	+250°C	
Drain-Source (V_{DSS})	250 V										
Gate-Source (V_{GS})	-1V										
Drain Current (I_{dg})	35A										
Storage Temperature	-65 to +150°C										
Operating Junction Temperature	+250°C										

ELECTRICAL CHARACTERISTICS @ 25°C

SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
I_{dss1}	Drain-Source Leakage Current	$V_{GS} = -15V, V_{DG} = 95V$			750	μA
I_{gss}	Gate-Source Leakage Current	$V_{GS} = -20V, V_{DS} = 0V$			50	μA
θ_{JC}^1	Thermal Resistance	$P_{out}=1250W$			0.15	$^{\circ}C/W$

FUNCTIONAL CHARACTERISTICS @ 25°C, $V_{dd} = 125V, I_{dq(avg)} = 500 mA, Freq = 155 MHz,$

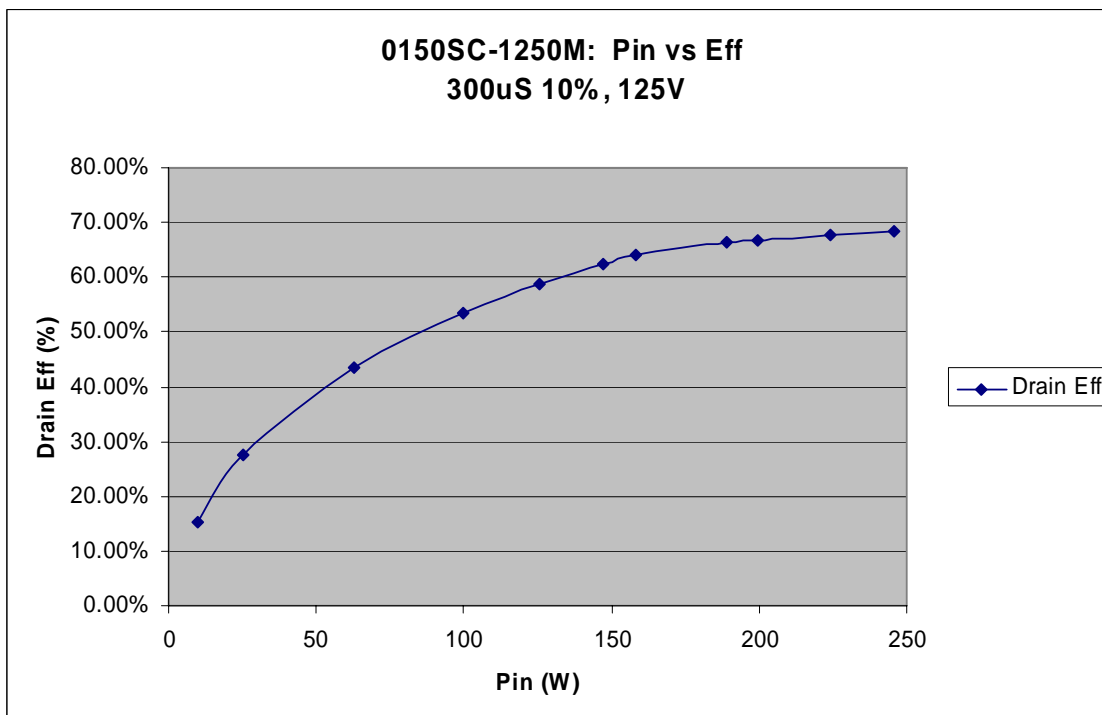
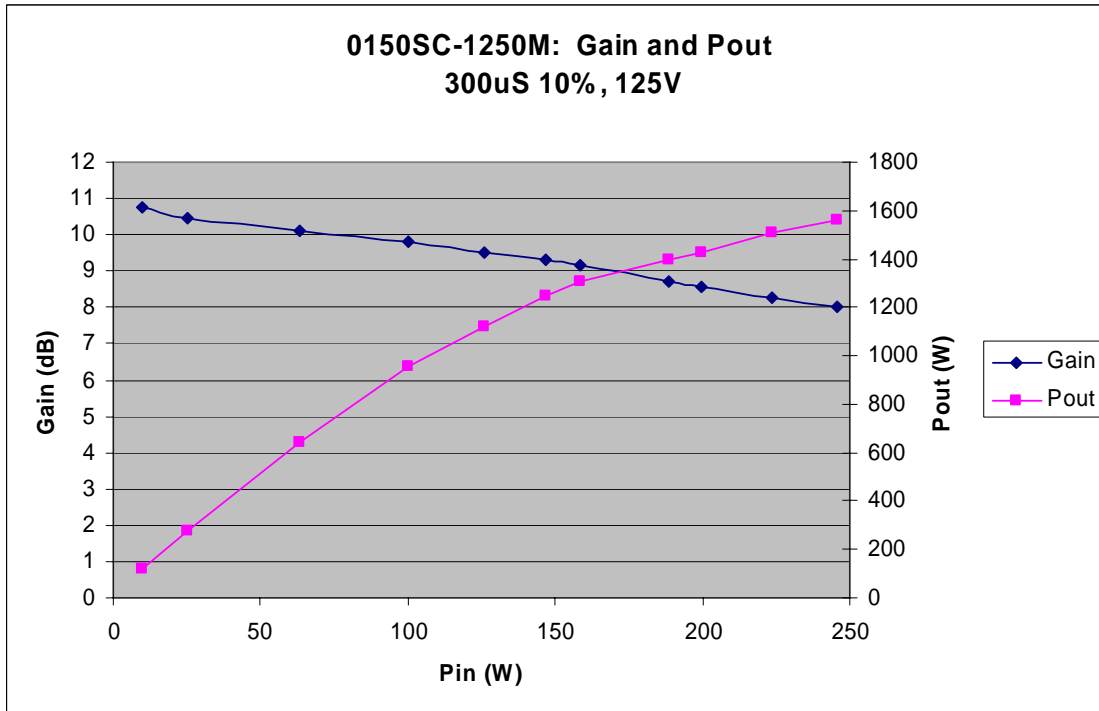
G_{PG}	Common Gate Power Gain	$P_{out} = 1250 W, Pulsed$	9.0	9.5		dB
P_{in}	Input Power	Pulse Width = 300us, DF = 10%		150	160	W
η_d	Drain Efficiency	$F = 155 MHz, P_{out}=1250W$	60			%
ψ	Load Mismatch	$F = 155 MHz, P_{out} = 1250W$			10:1	
$P_o +1dB$	Power Output – Higher Drive	$F = 155 MHz, P_{in} = 190 W$		1400		W
V_{sg}	Source-Gate Voltage	Set for $I_{dq(avg)} = 500 mA$	3.0		10.0	Volts

Dec 2008



0150SC-1250M

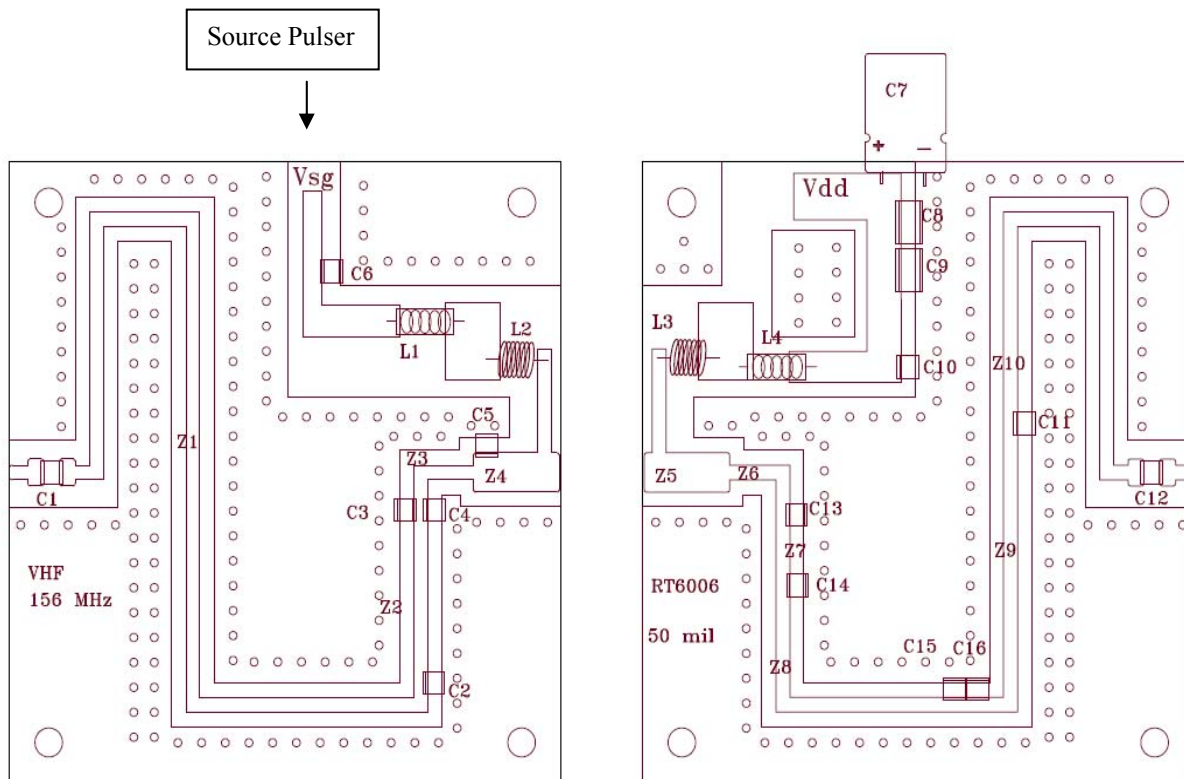
Typical RF Performance Curve





0150SC-1250M

Test Circuit Information



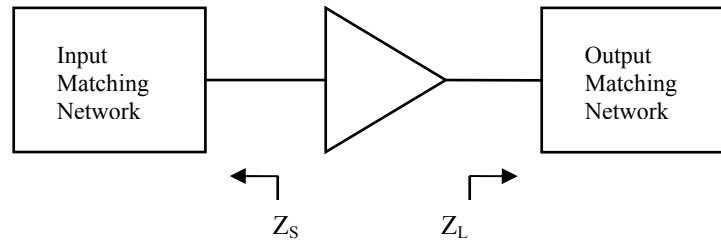
0150SC-1250M Test Circuit Component Designations and Values

Part	Description	Part	Description
C1, C6, C10, C12	2200pF Chip Capacitor (ATC 700B)	L1, L4	Ferrite Coil Inductor
C2	12pF Chip Capacitor (ATC 100B)	Z1	71 x 5450 mils (W x L)
C3	56pF Chip Capacitor (ATC 100B)	Z2	71 x 830 mils (W x L)
C4, 14	68pF Chip Capacitor (ATC 100B)	Z3	71 x 435 mils (W x L)
C5	100pF Chip Capacitor (ATC 100B)	Z4, Z5	190 x 430 mils (W x L)
C7	1000uF 160V Electrolytic Capacitor	Z6	71 x 555 mils (W x L)
C8, C9	1uF Chip Capacitor	Z7	71 x 340 mils (W x L)
C11, C15	15pF Chip Capacitor (ATC 100B)	Z8	71 x 1285 mils (W x L)
C13	47pF Chip Capacitor (ATC100B)	Z9	71 x 1520 mils (W x L)
C16	22pF Chip Capacitor (ATC100B)	Z10	71 x 2810 mils (W x L)
PCB	Rogers 6006, $\epsilon_r=6.15$, 50mils, 1oz		
L2, L3	7 Turns, 18AWG, IDIA 0.2"	Note:	All Z length dimensions include bends



0150SC-1250M

Impedance Information



Typical Impedance Values

Frequency (MHz)	$Z_S(\Omega)$	$Z_L(\Omega)$
156	$0.7 - j0.52$	$3.7 + j3.8$

* $V_{DD} = 125V$, $I_{DQ(avg)} = 500mA$, $P_{out} = 1250W$

* Pulse Format: $300\mu s$, 10% Long Term Duty Factor

Case Outline 55 KT FET

