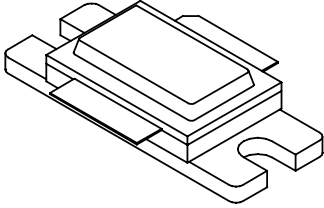




# 0405SC-1500M

1500Watts, 125 Volts, Class AB  
406 to 450 MHz  
Silicon Carbide SIT

## PRELIMINARY SPECIFICATION

<p><b>GENERAL DESCRIPTION</b></p> <p>The 0405SC-1500M is a <b>Common Gate N-Channel DEPLETION MODE Class AB SILICON CARBIDE (SiC) STATIC INDUCTION TRANSISTOR (SIT)</b> capable of providing 1500 Watts of RF power from 406 to 450 MHz. The transistor is designed for use in High Power Amplifiers supporting applications such as UHF Weather Radar and Long Range Tracking Radar. <b>The device is an addition to a series of High Power Silicon Carbide Transistors from Microsemi PPG.</b></p>	<p><b>CASE OUTLINE</b> <b>55ST FET</b> <b>(Common Gate)</b></p> 
<p><b>ABSOLUTE MAXIMUM RATINGS</b></p> <p><b>Voltage and Current</b></p> <p>Drain-Source (<math>V_{DSS}</math>) 250V Gate-Source (<math>V_{GS}</math>) -1V</p> <p><b>Temperatures</b></p> <p>Storage Temperature -65 to +150°C Operating Junction Temperature +250°C</p>	

## ELECTRICAL CHARACTERISTICS @ 25°C

SYMBOL	CHARACTERISTICS	TEST CONDITIONS	MIN	TYP	MAX	UNITS
$I_{dss}$	Drain-Source Leakage Current	$V_{GS} = -20V, V_{DG} = 125V$			750	$\mu A$
$I_{gss}$	Gate-Source Leakage Current	$V_{GS} = -20V, V_{DS} = 0V$			50	$\mu A$
$\theta_{JC}^1$	Thermal Resistance				0.15	°C/W

## FUNCTIONAL CHARACTERISTICS @ 25°C, $V_{dd} = 125V, I_{dq(ave)} = 125 mA, Freq = 406, 425, 450 MHz,$

$G_{PG}$	Common Gate Power Gain	$P_{out} = 1500 W, Pulsed$	7.5	8.0		dB
$P_{in}$	Input Power	Pulse Width = 300us, DF = 6%		250	270	W
$\eta_d$	Drain Efficiency	$F = 450 MHz, P_{out} = 1500W$	50	55		%
$\psi$	Load Mismatch	$F = 420 MHz, P_{out} = 1500W$			5:1	
Po +1dB	Power Output – Higher Drive	$F = 450 MHz, P_{in} = 255 W$		1600		W
$V_{gs}$	Gate source Voltage	Set for $I_{dq(ave)} = 125mA$	3.0		10.0	Volts

Note 1: Thermal Resistance rating is with operating conditions as a Pulsed RF transistor as listed under the Functional Characteristics

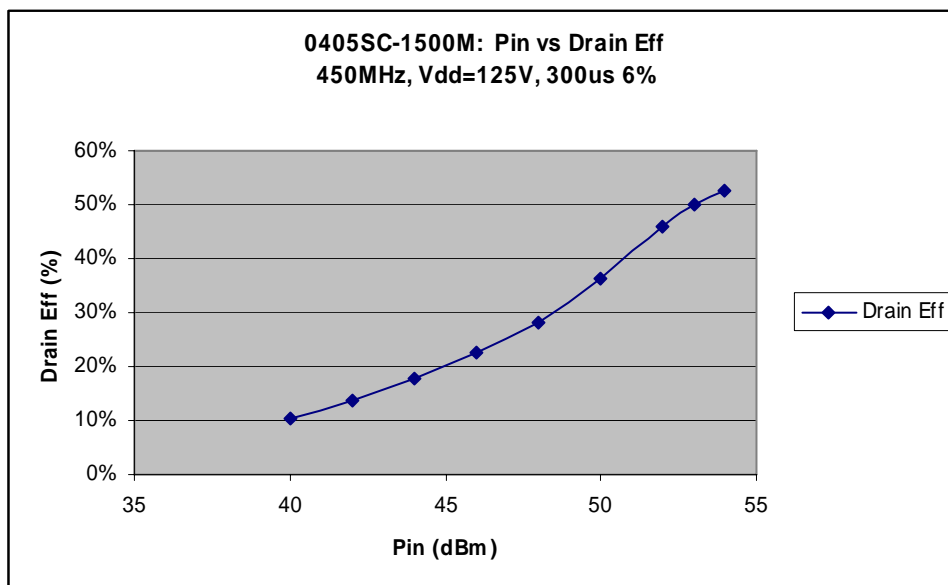
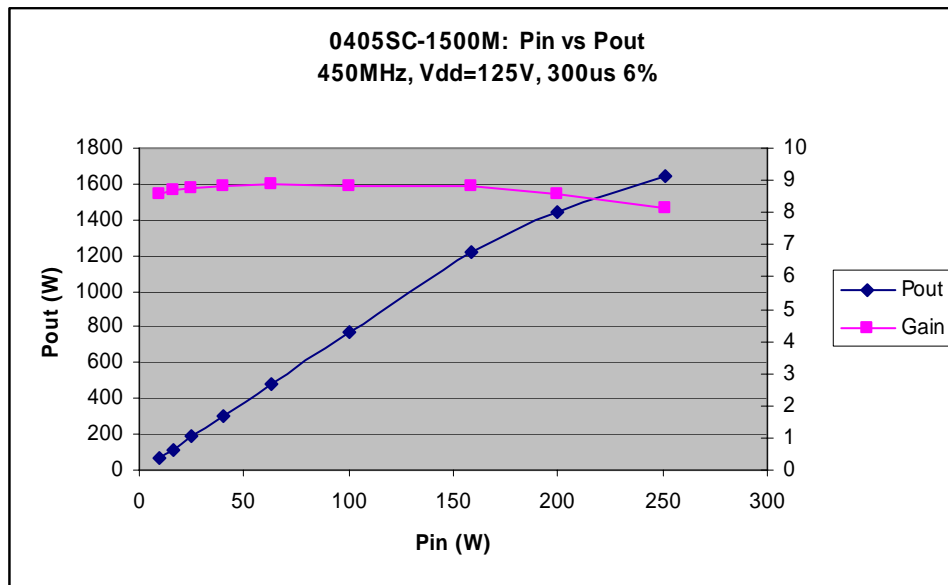
Note 2: Product Available May 2010

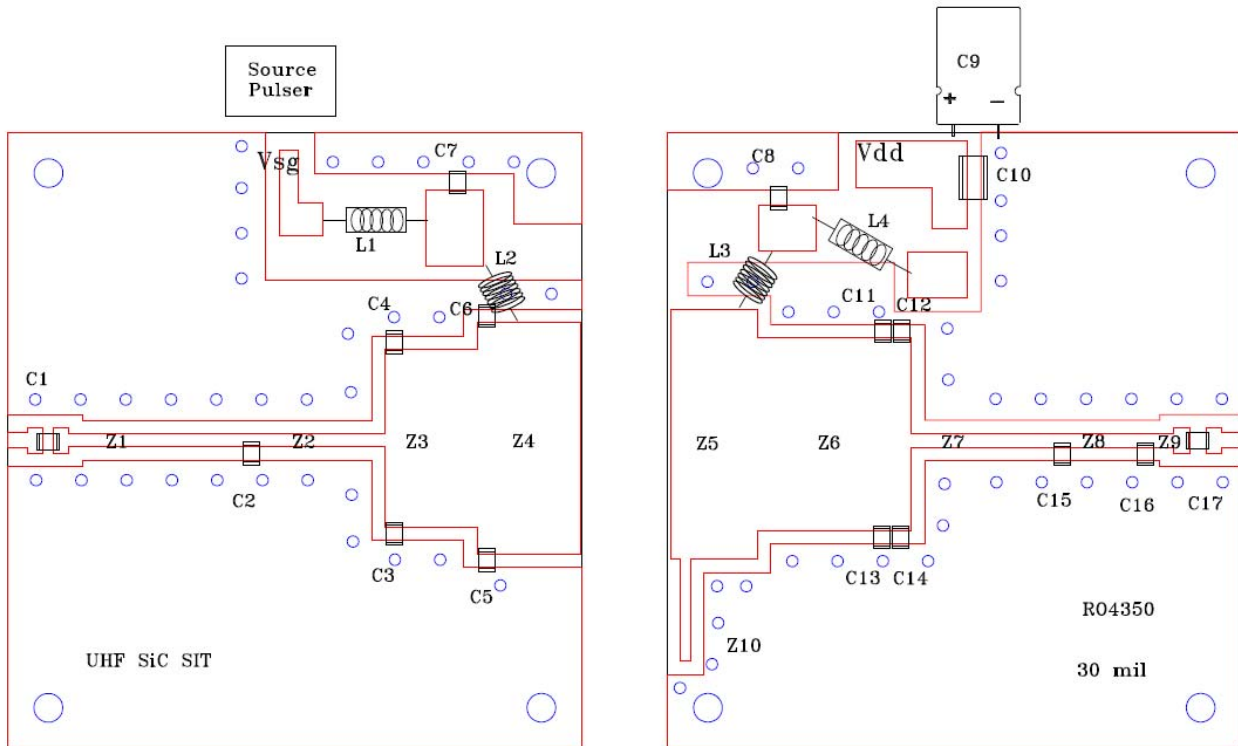
Rev B – Mar 2010



## 0405SC-1500M

### Typical RF Performance Curve



**Test Circuit board**


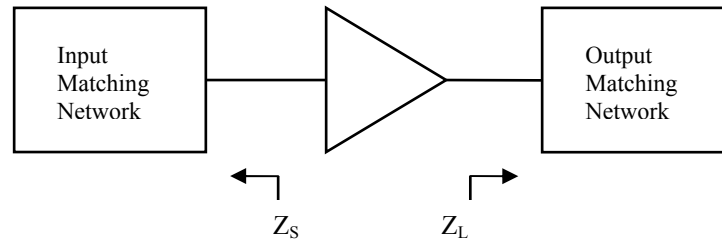
0405SC-1500M Test Circuit Component Designations and Values

Part	Description	Part	Description
C1, C7, C8, C17	330pF Chip Capacitor (ATC 100B)	Z1	65 x 960 mils (W x L)
C3, C4, C5, C6, C11, C13	20pF Chip Capacitor (ATC 100B)	Z2	65 x 650 mils (W x L)
C2, C15	15pF Chip Capacitor (ATC 100B)	Z3	865 x 450 mils (W x L)
C12, C14	24pF Chip Capacitor (ATC 100B)	Z4	1125 x 500 mils (W x L)
C16	4.7pF Chip Capacitor (ATC 100B)	Z5	1216 x 420 mils (W x L)
C9	1000uF 160V Electrolytic Capacitor	Z6	936 x 750 mils (W x L)
C10	1uF Chip Capacitor	Z7	65 x 732 mils (W x L)
		Z8	65 x 406 mils (W x L)
PCB	Rogers 4350, $\epsilon_r=3.48$ , 30mils, 1oz	Z9	65 x 214 mils (W x L)
		Z10	50 x 495 mils (W x L)
L2, L3	7 Turns, 18AWG, IDIA 0.2"		
L1, L4	Ferrite Coil Inductor	Note:	All Z length dimensions include bends



## 0405SC-1500M

### Impedance Information – Update in Process



#### Typical Impedance Values

Frequency (MHz)	$Z_S(\Omega)$	$Z_L(\Omega)$
406	$0.69 - j1.75$	$1.11 - j0.37$
425	$0.72 - j1.52$	$1.27 - j0.19$
450	$0.79 - j1.24$	$1.52 - j0.06$

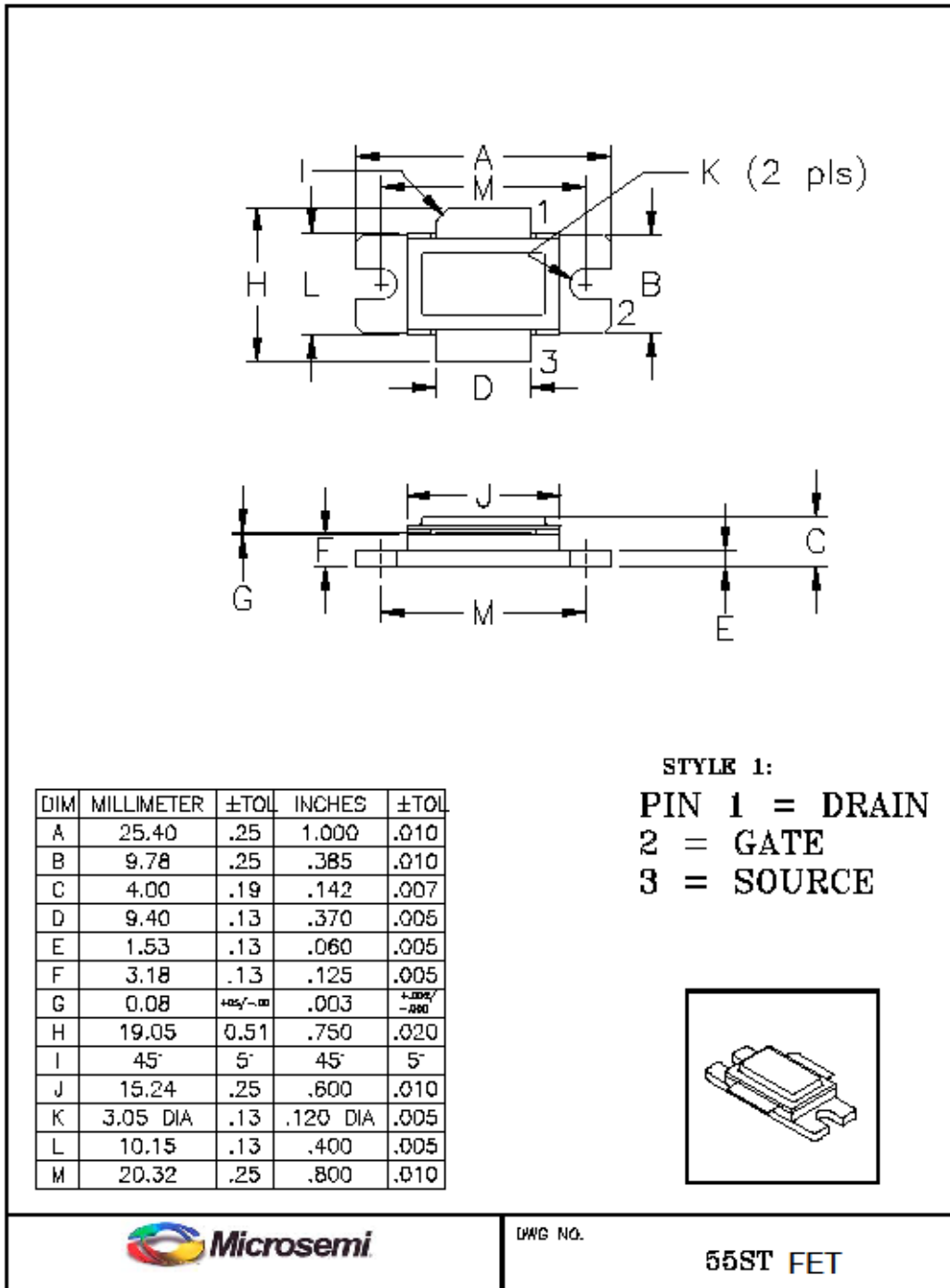
\*  $V_{DD} = 125V$ ,  $I_{DQ} = 125mA$  avg,  $P_{out} = 1500W$

\* Pulse Format:  $300\mu s$ , 6% Long Term Duty Factor



0405SC-1500M

## Case Outline 55 ST FET



DWG NO.

55ST FET

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