

0405SC-1000M

1000Watts, 125 Volts, Class AB

406 to 450 MHz

Silicon Carbide SIT

PRELIMINARY SPECIFICATION

GENERAL DESCRIPTION

The 0405SC-1000M is a **Common Gate N-Channel Class AB SILICON CARBIDE STATIC INDUCTION TRANSISTOR (SIT)** capable of providing 1000 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. **The device is an addition to a series of High Power Silicon Carbide Transistors from Microsemi PPG.**

ABSOLUTE MAXIMUM RATINGS

Voltage and Current

Drain-Source (V_{DS}) 250V

Gate-Source (V_{GS}) -1V

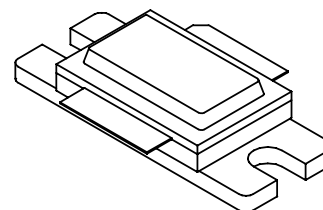
Temperatures

Storage Temperature -65 to +150°C

Operating Junction Temperature +250°C



CASE OUTLINE 55ST FET (Common Gate)



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	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS} = -20V, V_{DS} = 0V$			50	μA
θ_{JC}^{-1}	Thermal Resistance				0.15	$^{\circ}C/W$

FUNCTIONAL CHARACTERISTICS @ 25°C, $V_{DD} = 125V, I_{dq(ave)} = 250 mA, Freq = 406, 425, 450 MHz,$

G_{PG}	Common Gate Power Gain	$P_{out} = 1000 W, Pulsed$	8	8.5		dB
P_{in}	Input Power	Pulse Width = 300us, DF = 10%		140	155	W
η_d	Drain Efficiency	$F = 450 MHz, P_{out} = 1000W$	50			%
ψ	Load Mismatch	$F = 406 MHz, P_{out} = 1000W$			10:1	
$P_o + 1dB$	Power Output – Higher Drive	$F = 450 MHz, P_{in} = 180 W$		1100		W
V_{gs}	Gate source Voltage	Set for $I_{dq(ave)} = 150mA$	3.0		10.0	Volts

Rev F May 2010

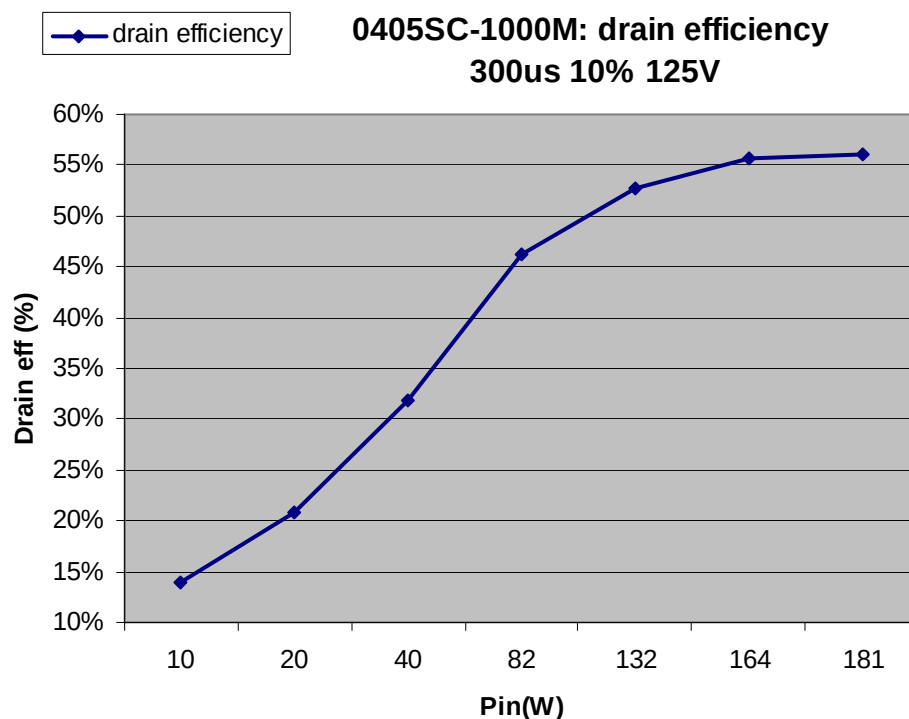
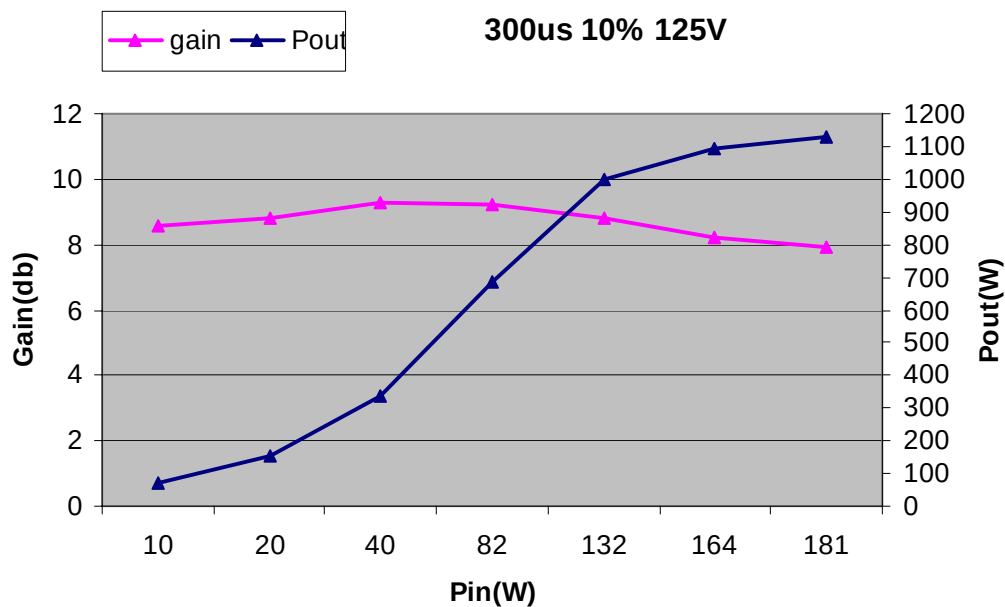


0405SC-1000M

Typical RF Performance Curve

0405SC-1000M: Gain & Pout

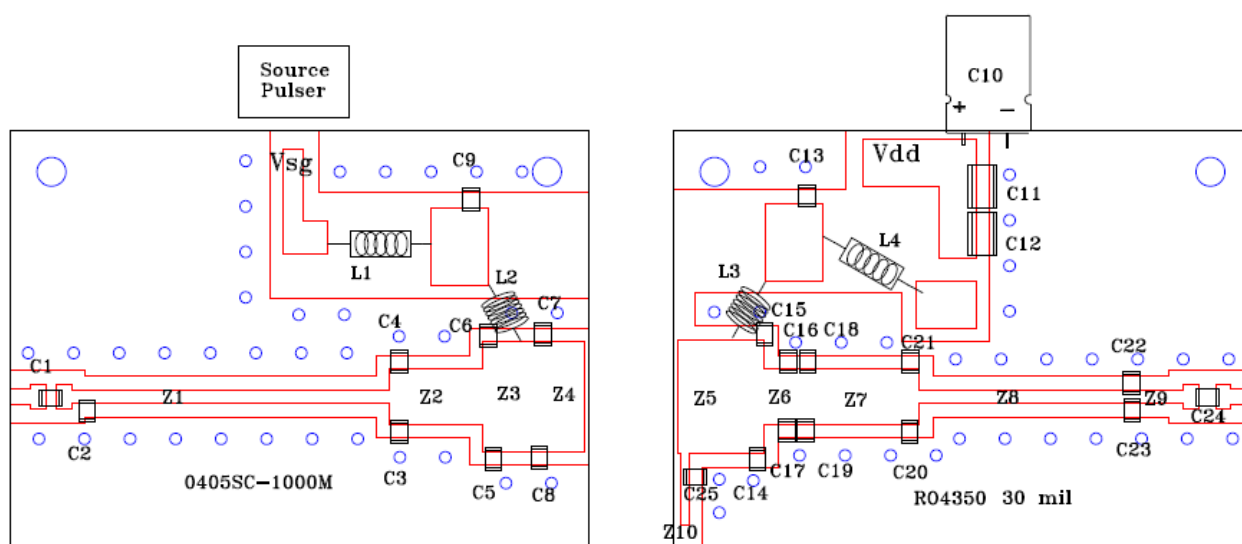
300us 10% 125V





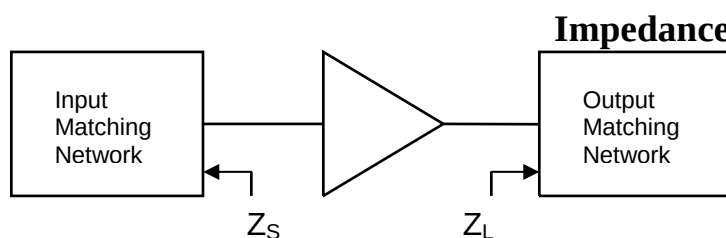
0405SC-1000M

Test Circuit board



0405SC-1000M Test Circuit Component Designations and Values

Part	Description	Part	Description
C1, C9, C13, C24, C25	330pF Chip Capacitor (ATC 100B)	Z1	65 x 1463 mils (W x L)
C2, C16, C19, C22, C23	10pF Chip Capacitor (ATC 100B)	Z2	270 x 450 mils (W x L)
C3, C17, C20, C21	33pF Chip Capacitor (ATC 100B)	Z3	530 x 273 mils (W x L)
C4	4.7pF Chip Capacitor (ATC 100B)	Z4	530 x 217 mils (W x L)
C5, C6, C7, C8	20pF Chip Capacitor (ATC 100B)	Z5	550 x 420 mils (W x L)
C10	1000uF 160V Electrolytic Capacitor	Z6	270 x 158 mils (W x L)
C11, C12	1uF Chip Capacitor	Z7	270 x 540 mils (W x L)
C14, C15, C18	18pF Chip Capacitor (ATC 100B)	Z8	65 x 1026 mils (W x L)
PCB	Rogers 4350, $\epsilon_r=3.48$, 30mils, 1oz	Z9	65 x 311 mils (W x L)
		Z10	40 x 345 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-1000M


Impedance Information

Frequency (MHz)	Z _S (Ohms)	Z _L (Ohms)
400	0.53 + j0.32	1.14 + j2.32
425	0.39 + j0.72	1.63 + j2.94
450	0.82 + j0.83	1.86 + j2.08

P_{out} = 1000W min

V_{dd} = 125V, I_{dq} = 150mA (Avg)

Pulse format: 300uS, 10% dc

CASE OUTLINE 55ST

