RF Products
Microsemi
Progress Powered by Technology

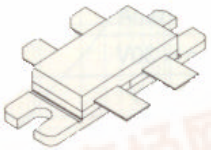
140 COMMERCE DRIVE
MONTGOMERYVILLE, PA
18936-1013
PHONE: (215) 631-9840
FAX: (215) 631-9855

MS1578

RF & MICROWAVE TRANSISTORS
800-960MHz CELLULAR BASE STATION

Features

- GOLD METALLIZATION
- DESIGNED FOR LINEAR OPERATION HIGH SATURATED POWER CAPABILITY
- POUT = 150 W PEP
- INTERNAL INPUT/OUTPUT MATCHING
- COMMON EMITTER CONFIGURATION
- 8.0dB GAIN @ 900 MHz
- MAX IMD -28dBc @ 150 W PEP
- 5:1 VSWR CAPABILITY @ RATED CONDITIONS
- 3 dB OVERDRIVE CAPABILITY

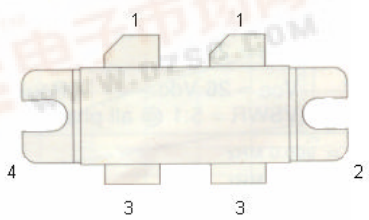


.400 X .860 4LFL (M208)

DESCRIPTION:

THE MS1578 IS A GOLD METALLIZED, EPITAXIAL SILICON, NPN PLANAR TRANSISTOR DESIGNED FOR HIGH LINEARITY CLASS AB OPERATION. DIFFUSED EMITTER BALLAST RESISTORS PROVIDE MAXIMUM RUGGEDNESS AND RELIABILITY FOR 900 MHz CELLULAR BASE STATION APPLICATIONS.

PIN CONNECTION



1. Collector
2. Emitter
3. Base
4. Emitter

ABSOLUTE MAXIMUM RATINGS (Tcase = 25°C)

Symbol	Parameter	Value	Unit
V_{CEO}	Collector-Emitter Voltage	28	V
V_{CBO}	Collector-Base Voltage	65	V
V_{EBO}	Emitter-Base Voltage	3.5	V
I_C	Device Current	25	A
P_{DISS}	Power Dissipation	300	W
T_J	Junction Temperature	+200	°C
T_{STG}	Storage Temperature	- 65 to + 150	°C

Thermal Data

$R_{TH(j-c)}$	Junction-Case Thermal Resistance	0.60	°C/W

RF Products
Microsemi
Progress Powered by Technology

MS1578

ELECTRICAL SPECIFICATIONS (Tcase = 25°C)

STATIC

Symbol	Test Conditions		Value			
			Min.	Typ.	Max.	Unit
BV_{CBO}	I_C = 50 mA	V_{BE} = 0 V	60			
BV_{CER}	I_C = 100 mA	R_{BE} = 75 Ω	35	---	---	V
BV_{CEO}	I_C = 100 mA	I_B = 0 mA	28	---	---	V
BV_{EBO}	I_E = 10 mA	I_C = 0 mA	3.5	---	---	V
I_{CEO}	V_{CE} = 30 V	V_{BE} = 0 V	---	---	10	mA
h_{FE}	V_{CE} = 5 V	I_C = 6 A	25	---	120	

Tested per side

DYNAMIC

Symbol	Test Conditions	Value			
		Min.	Typ.	Max.	Unit
G_P*	V_{CC} = 26 Vdc P_{OUT} = 150 W PEP I_{CQ} = 2 x 200 mA	8.5	9.0	---	dB
η_C*	V_{CC} = 26 Vdc P_{OUT} = 150 W PEP I_{CQ} = 2 x 200 mA	30	---	---	%
IMD	V_{CC} = 26 Vdc P_{OUT} = 150 W PEP I_{CQ} = 2 x 200 mA	---	-32	-28	dBc
LOAD* MISMATCH	V_{CC} = 26 Vdc P_{OUT} = 150 W PEP I_{CQ} = 2 x 200 mA VSWR = 5:1 @ all phase angles				

*Note: f_1 = 900.0 MHz f_2 = 900.1 MHz

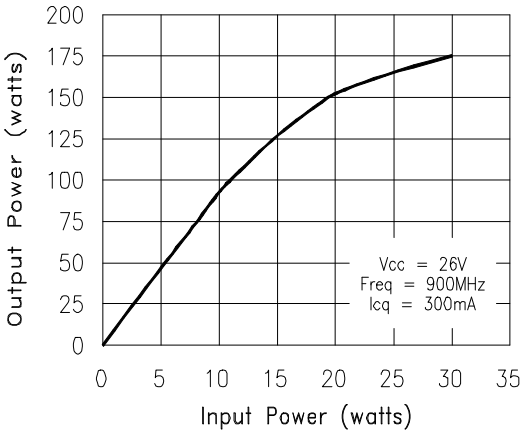
IMPEDANCE DATA

FREQ	$Z_{IN}(\Omega)$	$Z_{CL}(\Omega)$
800 MHz	4.25 + j12.25	5.75 - j4.25
860 MHz	4.75 + j10.25	5.00 - j3.00
900 MHz	7.75 + j10.25	4.25 - j2.90
960 MHz	8.50 + j 9.50	3.40 - j2.85
1000 MHz	8.50 + j13.25	2.75 - j3.15

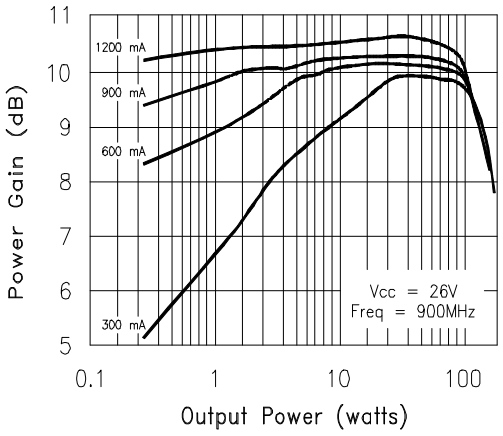
P_{OUT} = 150W PEP V_{CE}=26V

TYPICAL PERFORMANCE

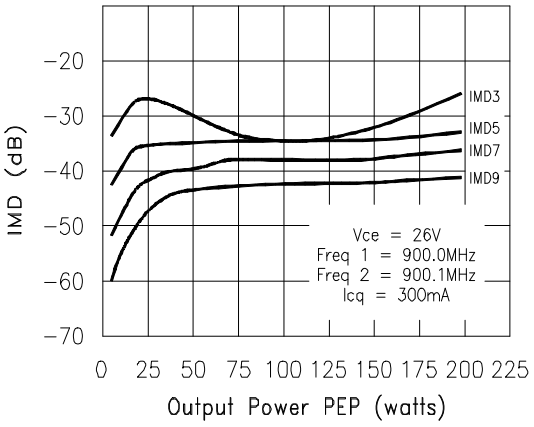
POWER OUTPUT vs POWER INPUT



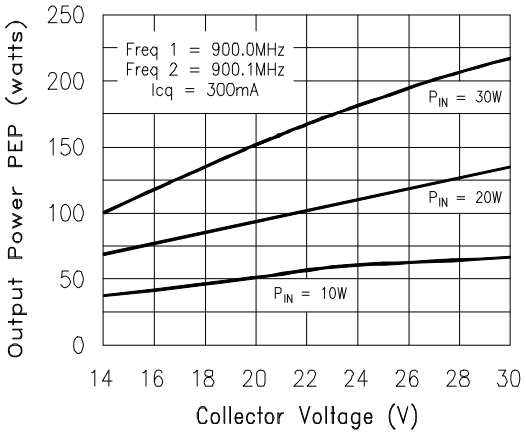
POWER GAIN vs POWER OUTPUT



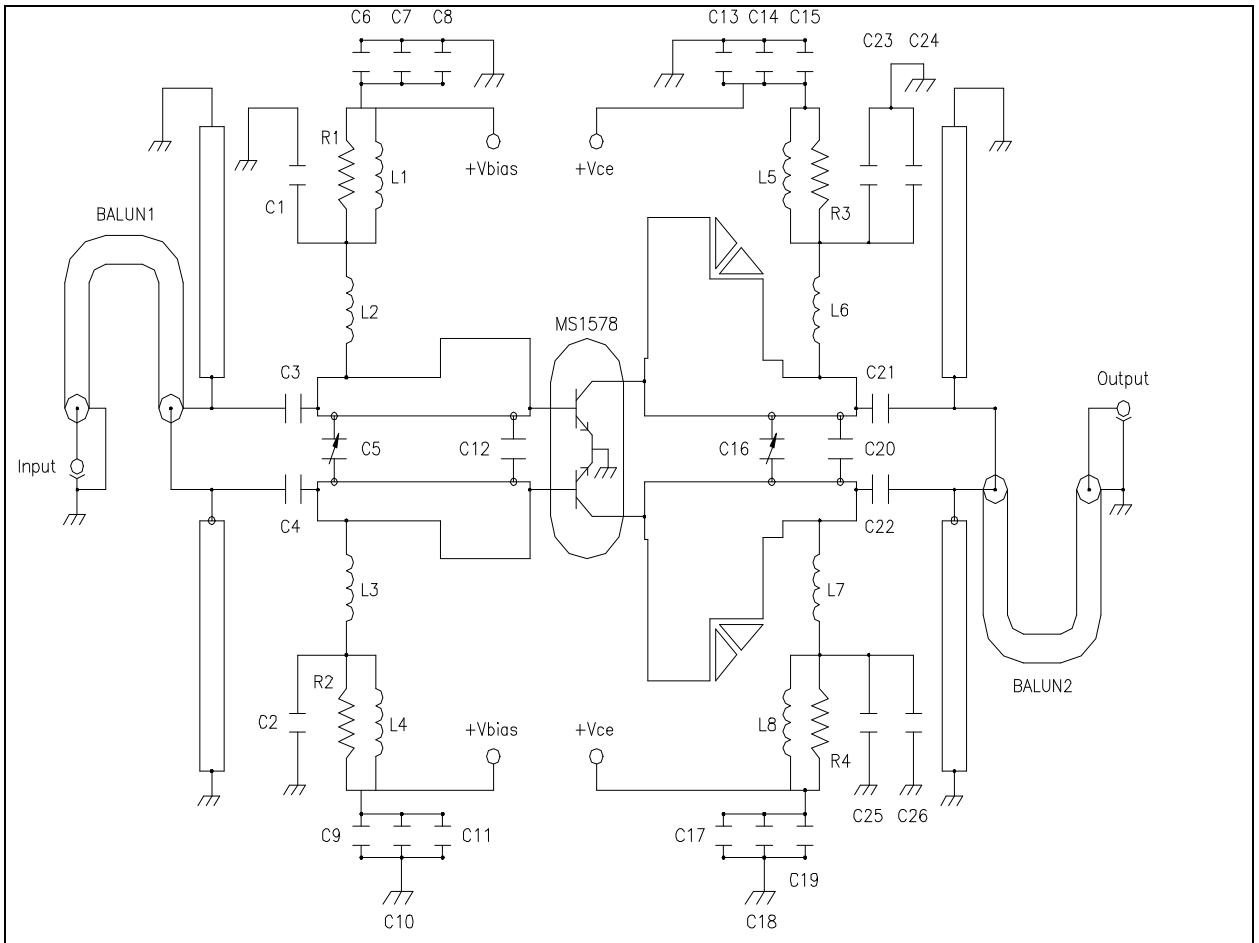
INTERMODULATION DISTORTION vs POWER OUTPUT



POWER OUTPUT vs SUPPLY VOLTAGE



TEST CIRCUIT

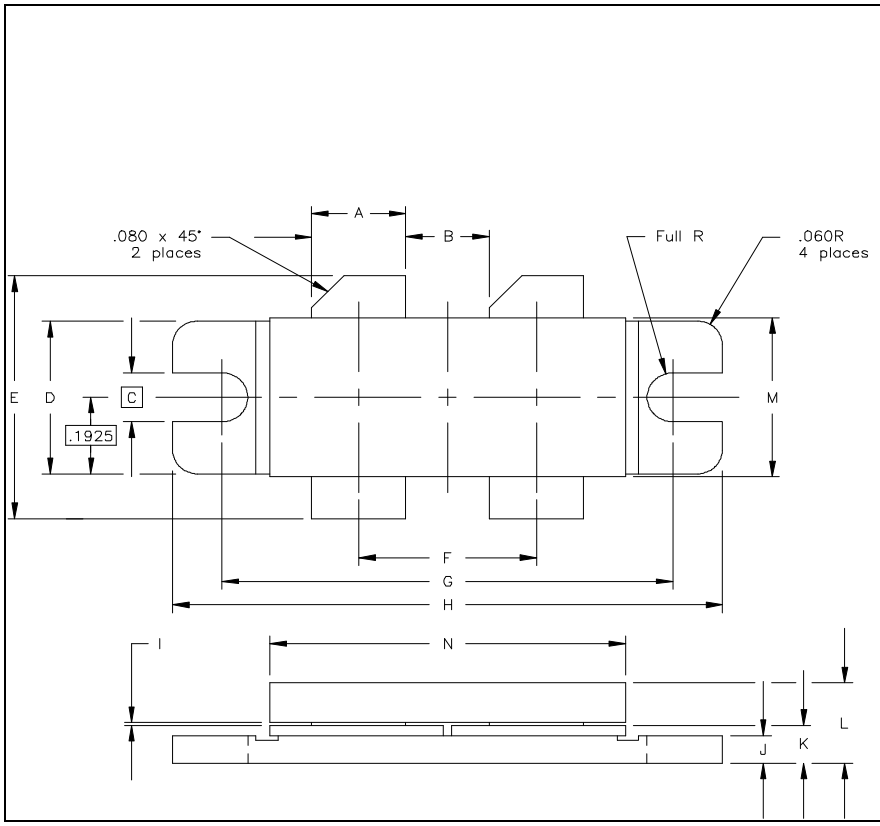


Balun 1, 2	: 50Ω Coaxial Cable Length 2.2"	C20	: 1.3pF Ceramic Chip, ATC B
C1, C2, C23, C25	: 91pF Ceramic Chip, ATC B	C24, C26	: 47uF, 35V Tantalum
C3, C4, C21, C22	: 2 x 39pF Ceramic Chip, ATC B		
C5, C16	: 0.8 – 8pF Variable, JOHANSON Giga-Trim	L1, L4, L5, L8	: 12 Turns, #22 AWG, 0.15" I.D. (Tight)
C6, C9, C15, C19	: 1000pF Ceramic Chip, ATC B	L2, L3, L6, L7	: 4 Turns, #20 AWG, 0.13" I.D. (1:1)
C7, C10, C14, C18	: 20nF Ceramic Chip, ATC B		
C8, C11	: 100uF, 50V Electrolytic	R1, R2, R3, R4	: 5 x 50Ω Chip Resistor
C13, C17	: 470uF, 50V Electrolytic	Board Material	: ROGERS, Er = 2.55, Height = 31.25 mil 1oz. Cu.
C12	: 9.1pF, Ceramic Chip, ATC A	See Photomaster for Microstrip Lines.	

RF Products
Microsemi
Progress Powered by Technology

MS1578

PACKAGE MECHANICAL DATA



	Minimum inches/mm	Maximum inches/mm
A	.220/5,59	.230/5,84
B	.210/5,33	
C	.125/3,18	
D	.380/9,65	.390/9,91
E	.580/14,73	.620/15,75
F	.435/11,05	
G	1.090/27,69	1.105/28,07
H	1.335/33,91	1.345/34,16
I	.003/0,08	.007/0,18
J	.060/1,52	.070/1,78
K	.082/2,08	.097/2.46
L	---	.205/5,21
M	.395/10,03	.407/10,34
N	.850/21,59	.870/22,10