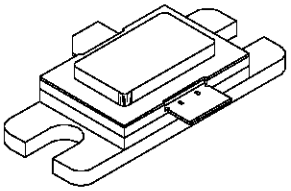
SGS-THOMSON MICROELECTRONICS

AM1011-500

RF & MICROWAVE TRANSISTORS AVIONICS APPLICATIONS

- P_{OUT} = 500 W MIN. WITH 8.5 dB MIN. GAIN
- 10:1 LOAD VSWR CAPABILITY @ 10μS., 1% DUTY
- SIXPAC™ HERMETIC METAL/CERAMIC PACKAGE
- EMITTER SITE BALLASTED OVERLAY GEOMETRY
- REFRACTORY/GOLD METALLIZATION
- LOW THERMAL RESISTANCE
- INTERNAL INPUT/OUTPUT MATCHING
- CHARACTERIZED UNDER 32μS.,2% DUTY CYCLE PULSE CONDITIONS



.400 x .600 2LFL (M198)
hermetically sealed

ORDER CODE	BRANDING
AM1011-500	1011-500

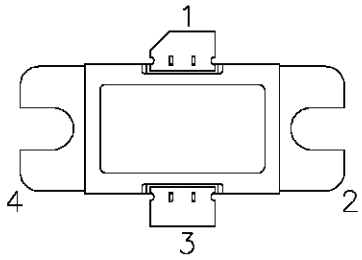
DESCRIPTION

The AM1011-500 device is a high power Class C transistor specifically designed for L-Band Avionic applications involving high pulse burst duty cycles.

This device is capable of operation over a wide range of pulse widths, duty cycles, and temperatures. Low RF thermal resistance and computerized automatic wire bonding techniques ensure high reliability and product consistency.

The AM1011-500 is supplied in the SIXPAC™ Hermetic metal/ceramic package with internal input/output matching structures.

PIN CONNECTION



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

ABSOLUTE MAXIMUM RATINGS (T_{case} = 25°C)

Symbol	Parameter	Value	Unit
P_{DISS}	Power Dissipation* ($T_C \leq 100°C$)	1,360	W
I_C	Device Current*	27	A
V_{CC}	Collector-Supply Voltage*	55	V
T_J	Junction Temperature (Pulsed RF Operation)	250	°C
T_{STG}	Storage Temperature	– 65 to +200	°C

THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance*	0.11	°C/W

*Applies only to rated RF amplifier operation

ELECTRICAL SPECIFICATIONS (T_{case} = 25°C)

STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	I_C = 50 mA	I_E = 0 mA	70	—	—	V
BV_{EBO}	I_E = 30 mA	I_C = 0 mA	3.0	—	—	V
BV_{CES}	I_C = 50 mA	V_{BE} = 0 V	70	—	—	V
I_{CES}	V_{BE} = 0 V	V_{CE} = 50 V	—	—	40	mA
h_{FE}	V_{CE} = 5 V	I_C = 1.0 A	10	—	200	—

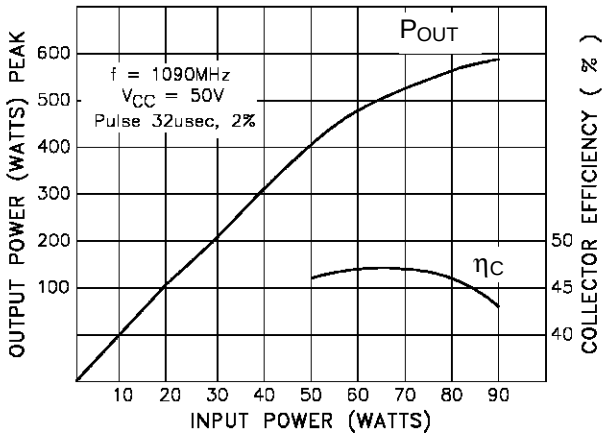
DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 1090 MHz	P_{IN} = 70 W	V_{CC} = 50 V	500	—	—	W
hc	f = 1090 MHz	P_{OUT} = 500 W	V_{CC} = 50 V	40	—	—	%
G_P	f = 1090 MHz	P_{OUT} = 500 W	V_{CC} = 50 V	8.5	—	—	dB
Load Mismatch	P_{OUT} = 500 W Peak F = 1090MHz V_{CC} = 50 V	VSWR = 10:1, 10µS, 1% Duty VSWR = 5:1, 32µS, 2% Duty		No Degradation in Output Power			

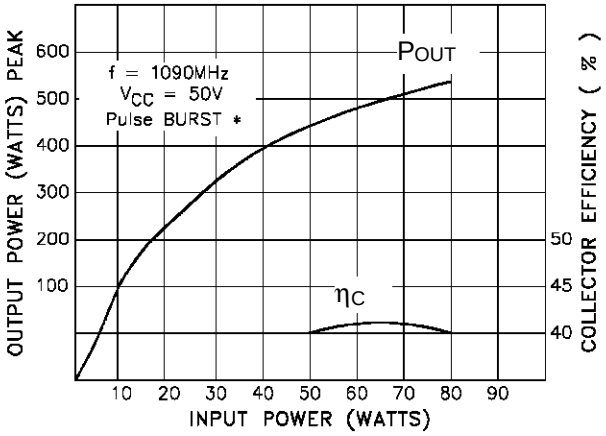
Note: Pulse Width = 32µSec, Duty Cycle = 2%

TYPICAL PERFORMANCE

POWER OUTPUT & COLLECTOR EFFICIENCY vs POWER INPUT



POWER OUTPUT & COLLECTOR EFFICIENCY vs POWER INPUT



* Pulse Burst conditions:
128 µSec train, 0.5 µSec on,
0.5 µSec off; with a period of 6.4 msec.

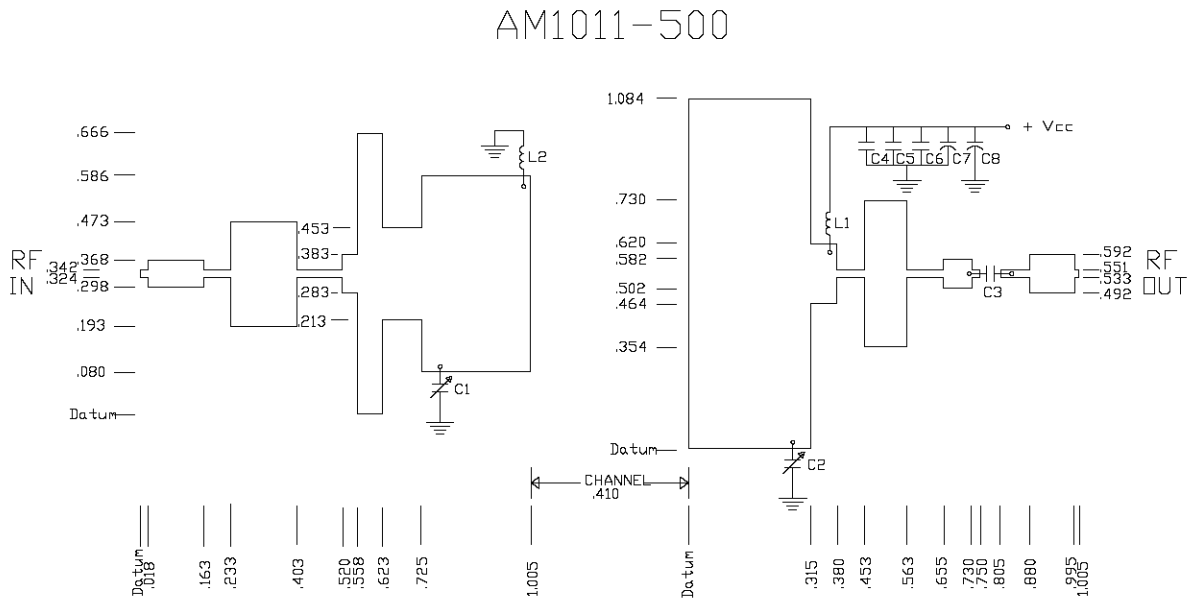
IMPEDANCE DATA

FREQ.	$Z_{IN}(\Omega)$	$Z_{CL}(\Omega)$
1030 MHz	4.35 + j 6.97	1.38 – j 4.08
1090 MHz	4.38 + j 2.75	.874 – j 3.55
1120 MHz	4.69 + j 2.95	1.3 – j 4.97

P_{IN} = 70W

V_{CC} = 50V

TEST CIRCUIT



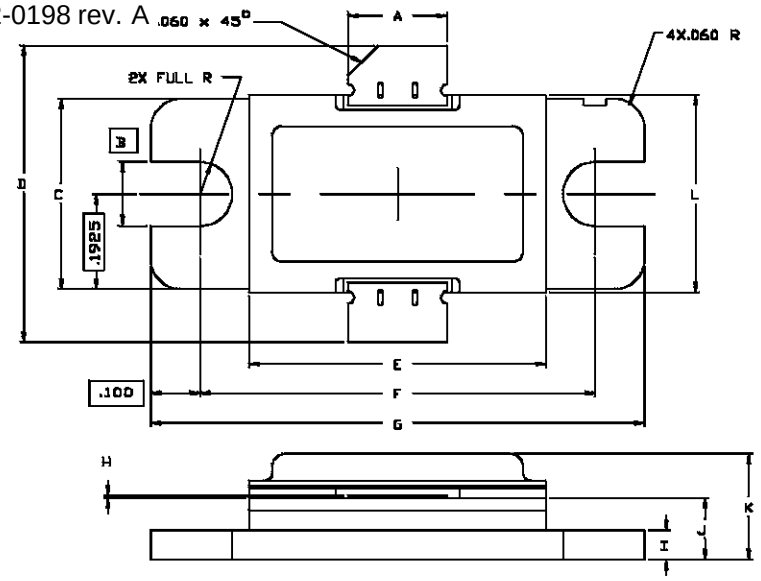
C1 : 0.8-8.0 pf Gigatrim
C2 : 0.6-4.5 pf Gigatrim
C3 : 100 pf ATC Chip
C4 : 39 pf ATC Chip
C5 : 91 pf ATC Chip
C6 : .1 uf ceramic cap
C7 : 100 uf Electrolytic,63 V
C8 : 6600 uf Electrolytic external storage cap

L1 : 1 turn, #22 AWG
L2 : Strap - shim stock, .300 long, .125 wide, .005 thick
Substrate : Er = 10.2, H = 0.025

Notes:
1. Freq = 1090 MHz
2. All dimentions are in inches.

PACKAGE MECHANICAL DATA

Ref.: Dwg. No. 12-0198 rev. A



SGS-THOMSON MICROELECTRONICS			CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm		MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.195/4,95	.205/5,21	K		.230/5,84
B	.130/3,30		L	.393/9,98	.407/10,34
C	.380/9,65	.390/9,91			
D	.570/14,48				
E	.593/15,06	.607/15,42			
F	.790/20,07	.810/20,57			
G	.995/25,27	1.005/25,53			
H	.002/0,05	.006/0,15			
I	.055/1,40	.065/1,65			
J	.110/2,79	.130/3,30			