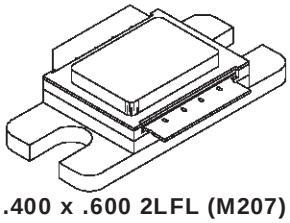
SGS-THOMSON MICROELECTRONICS

AM1011-300

RF & MICROWAVE TRANSISTORS AVIONICS APPLICATIONS

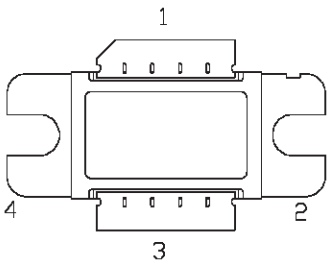
- REFRACTORY/GOLD METALLIZATION
- EMITTER SITE BALLASTING
- LOW RF THERMAL RESISTANCE
- INPUT/OUTPUT MATCHING
- OVERLAY GEOMETRY
- METAL/CERAMIC HERMETIC PACKAGE
- P_{OUT} = 325 W MIN. WITH 7.7 dB GAIN
- 1030/1090 MHZ OPERATION



.400 x .600 2LFL (M207)
hermetically sealed

ORDER CODE	BRANDING
AM1011-300	AM1011-300

PIN CONNECTION



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

DESCRIPTION

The AM1011-300 is a rugged, Class C common base device specifically designed for new Mode-S interrogator and transponder applications.

Minimal amplitude droop over the heavy Mode-S pulse burst is guaranteed by a thermal design incorporating an overlay site-ballasted die geometry.

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

Symbol	Parameter	Value	Unit
P_{DISS}	Power Dissipation (T_C ≤100°C)*	1070	W
I_C	Device Current*	36	A
V_{CC}	Collector-Supply Voltage*	43	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*	0.14	°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 = 75 mA	I_E = 0 mA	65	—	—	V
BV_{CES}	I_C = 75 mA	V_{BE} = 0 V	65	—	—	V
BV_{EBO}	I_C = 25 mA	I_C = 0 mA	3.0	—	—	V
I_{CES}	V_{CE} = 40 V	V_{BE} = 0 V	—	—	30	mA
h_{FE}	V_{CE} = 5 V	I_C = 10 A	10	—	—	—

DYNAMIC

Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
P_{OUT}	f = 1090 MHz	P_{IN} = 55 W	V_{CC} = 40 V	325	350	—	W
hc	f = 1090 MHz	P_{OUT} = 325 W	V_{CC} = 40 V	40	45	—	%
G_P	f = 1090 MHz	P_{OUT} = 325 W	V_{CC} = 40 V	7.7	8.0	—	dB

Pulse Conditions: Pulse width = 200µs, Duty Cycle = 5%, are equivalent to the following pulse burst conditions:

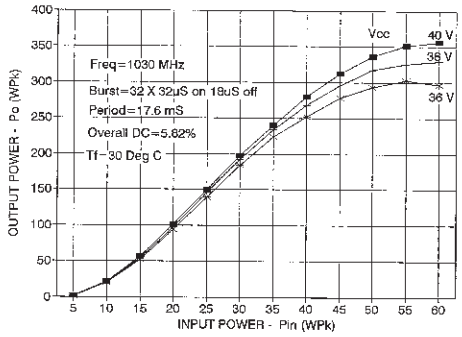
Mode-S Interrogator (freq = 1030MHz)

32 pulses, 32µs on, 18µs off, burst period = 17.6ms

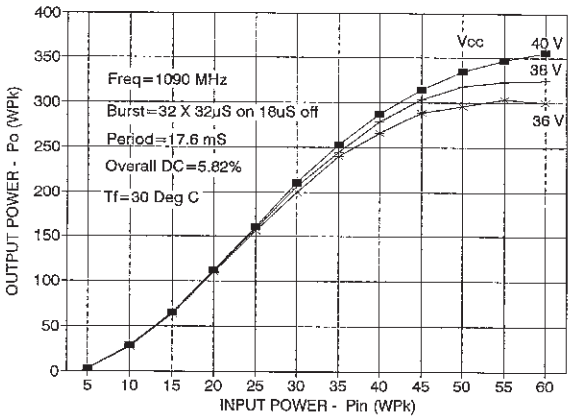
long term duty = 5.82%

TYPICAL PERFORMANCE

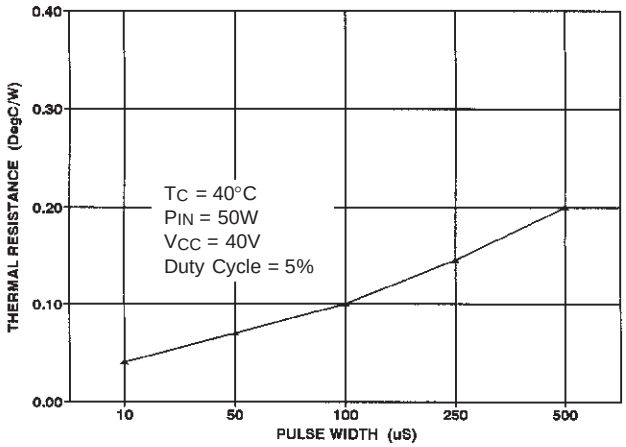
POWER OUTPUT vs POWER INPUT @ 1030 MHz



POWER OUTPUT vs POWER INPUT @ 1090 MHz



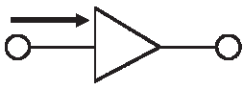
MAXIMUM THERMAL RESISTANCE vs PULSE WIDTH



IMPEDANCE DATA

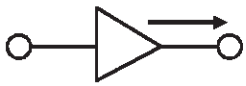
TYPICAL INPUT IMPEDANCE

Z_{IN}



TYPICAL COLLECTOR LOAD

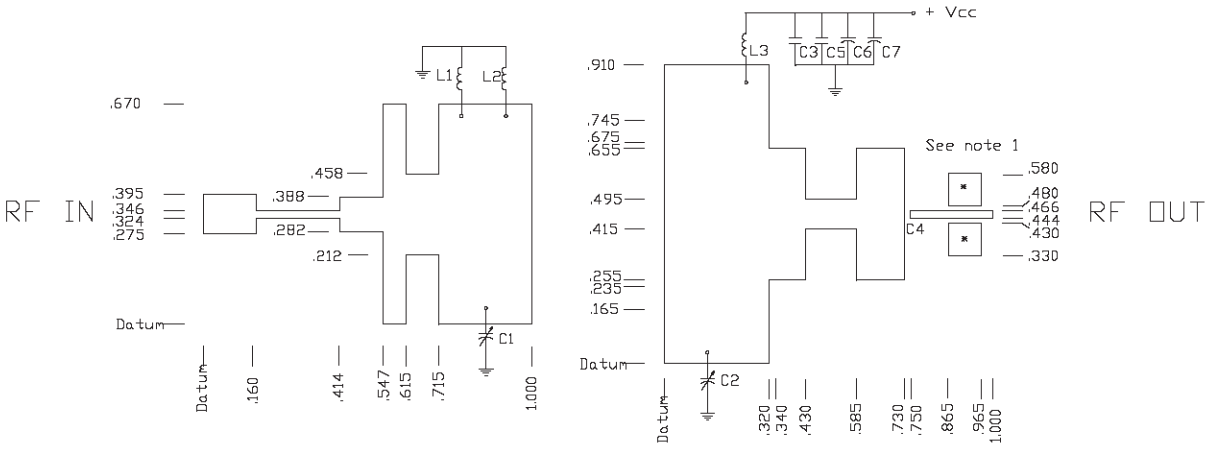
Z_{CL}



FREQ.	$Z_{IN}(\Omega)$	$Z_{CL}(\Omega)$
1030 MHz	0.7 + j 4.1	0.78 – j 2.4
1090 MHz	0.65 + j 4.2	0.4 – j 2.4

P_{IN} = 55W

TEST CIRCUIT

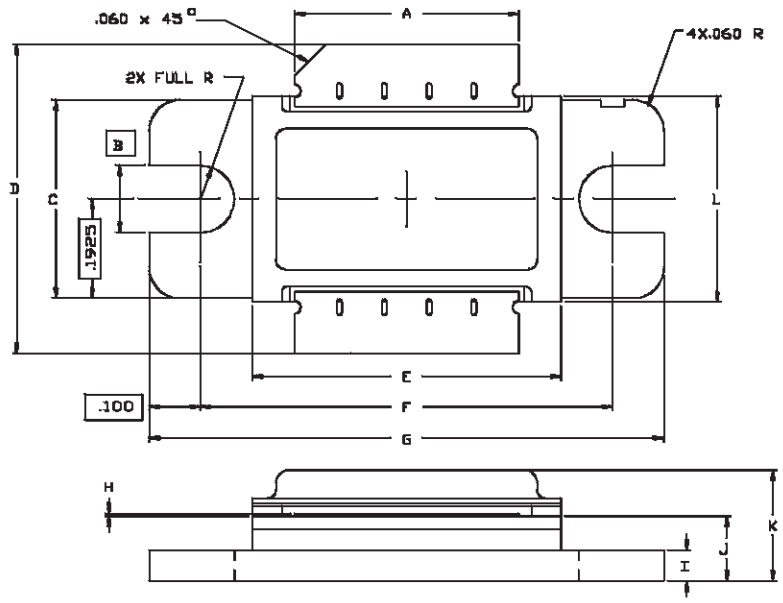


C1 : 0.8-8.0 pf Johanson Gigatrim
C2 : 0.6-4.5 pf Johanson Gigatrim
C3,C4 : 100 pf Chips
C5 : 47 pf Chip
C6 : 10 uF Tantalum,50 V
C7 : 100 uF Electrolytic,63 V
L1,L2 : Straps 0.300" long,0.100" wide and 0.005" thick
L3 : 3 Turns #24 wire,0.085" ID
Substrate : Er=10.2 H=0.025"

Notes:
1. Freq=1030/1090 MHz
   * denotes areas to be connected for 1030 MHz operation only.
2. Power supply should have at least 5 joules (6600 uF) of energy storage.
3. Air cooling required.
4. All dimensions are in inches.

PACKAGE MECHANICAL DATA

Ref.: Dwg. No. 12-0207
UDCS No. 1011408 rev B



SGS-THOMSON MICROELECTRONICS			CONT'D		
	MINIMUM Inches/mm	MAXIMUM Inches/mm		MINIMUM Inches/mm	MAXIMUM Inches/mm
A	.435/11,05	.445/11,30	K		.230/5,84
B	.130/3,30		L	.395/10,03	.407/10,34
C	.380/9,65	.390/9,91			
D	.570/14,48	.630/16.00			
E	.590/14,99	.610/15,49			
F	.790/20,07	.810/20,57			
G	.995/25,27	1.010/25,65			
H	.003/0,08	.006/0,15			
I	.055/1,40	.065/1,65			
J	.115/2,92	.130/3,30			