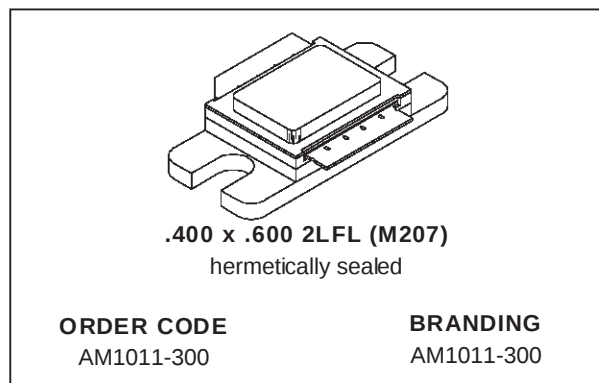


RF & MICROWAVE TRANSISTORS AVIONICS APPLICATIONS

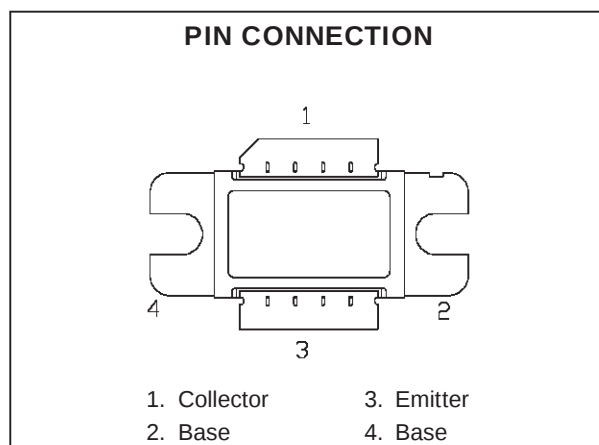
- REFRACTORY/GOLD METALLIZATION
- EMITTER SITE BALLASTING
- LOW RF THERMAL RESISTANCE
- INPUT/OUTPUT MATCHING
- OVERLAY GEOMETRY
- METAL/CERAMIC HERMETIC PACKAGE
- $P_{OUT} = 325 \text{ W MIN. WITH } 7.7 \text{ dB GAIN}$
- 1030/1090 MHZ OPERATION



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 ($T_{case} = 25^{\circ}\text{C}$)

Symbol	Parameter	Value	Unit
P_{DISS}	Power Dissipation ($T_C \leq 100^{\circ}\text{C}$)*	1070	W
I_C	Device Current*	36	A
V_{CC}	Collector-Supply Voltage*	43	V
T_J	Junction Temperature (Pulsed RF operation)	+250	$^{\circ}\text{C}$
T_{STG}	Storage Temperature	- 65 to +200	$^{\circ}\text{C}$

THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance*	0.14	$^{\circ}\text{C/W}$
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*Applies only to rated RF amplifier operation.

ELECTRICAL SPECIFICATIONS ($T_{\text{case}} = 25^{\circ}\text{C}$)**STATIC**

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
BV_{CBO}	$I_C = 75 \text{ mA}$	$I_E = 0 \text{ mA}$	65	—	—	V
BV_{CES}	$I_C = 75 \text{ mA}$	$V_{BE} = 0 \text{ V}$	65	—	—	V
BV_{EBO}	$I_C = 25 \text{ mA}$	$I_C = 0 \text{ mA}$	3.0	—	—	V
I_{CES}	$V_{CE} = 40 \text{ V}$	$V_{BE} = 0 \text{ V}$	—	—	30	mA
h_{FE}	$V_{CE} = 5 \text{ V}$	$I_C = 10 \text{ A}$	10	—	—	—

DYNAMIC

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

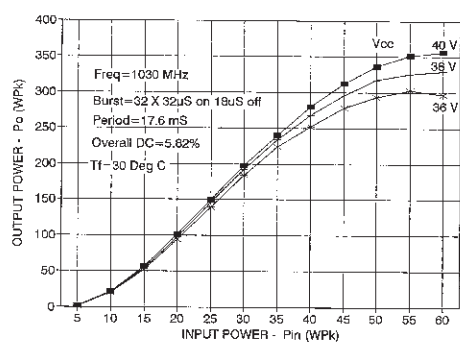
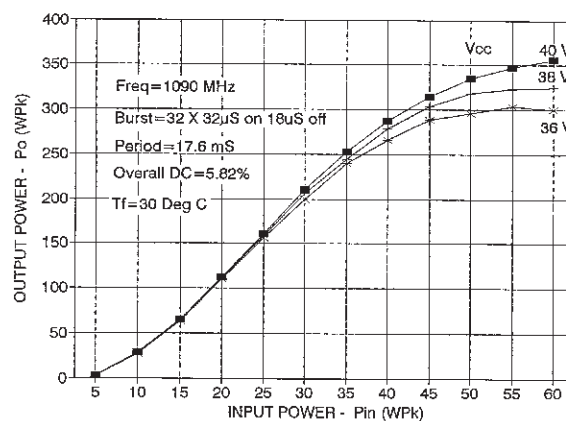
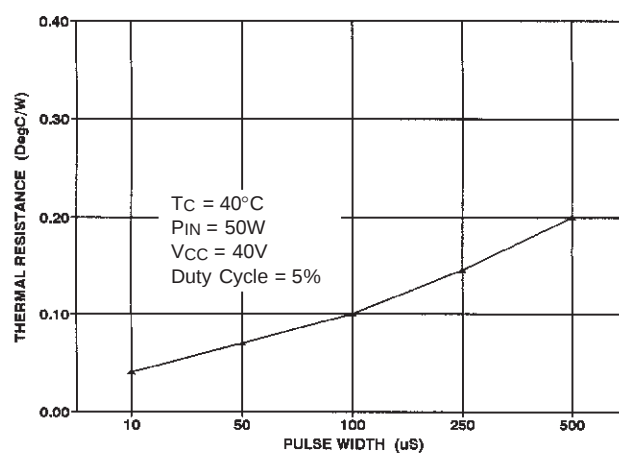
Pulse Conditions: Pulse width = 200 μ s, Duty Cycle = 5%, are equivalent to the following pulse burst conditions:

Mode-S Interrogator (freq = 1030MHz)

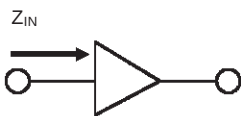
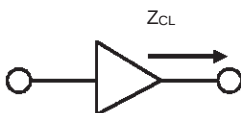
32 pulses, 32 μ s on, 18 μ s off, burst period = 17.6ms

long term duty = 5.82%

TYPICAL PERFORMANCE

POWER OUTPUT vs POWER INPUT
@ 1030 MHzPOWER OUTPUT vs POWER INPUT
@ 1090 MHzMAXIMUM THERMAL RESISTANCE vs
PULSE WIDTH

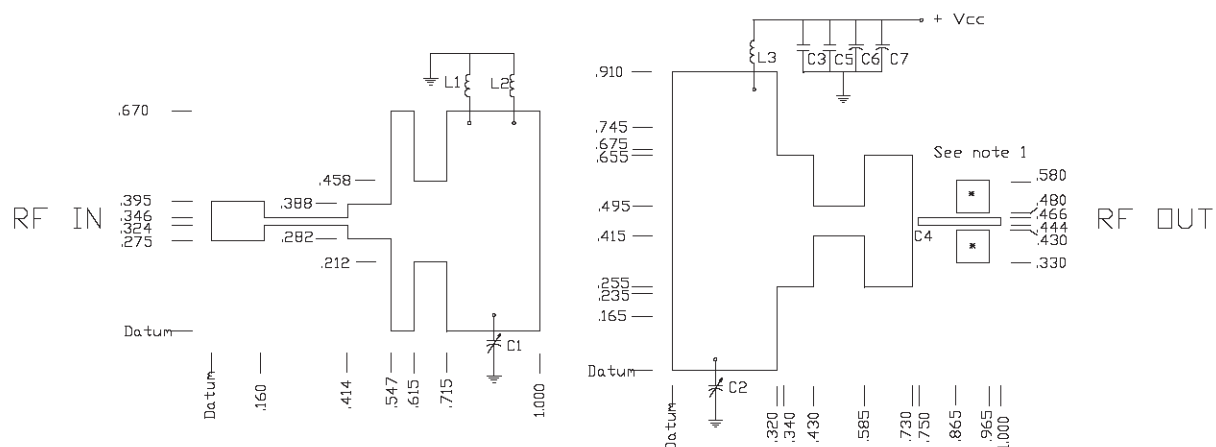
IMPEDANCE DATA

TYPICAL INPUT
IMPEDANCETYPICAL
COLLECTOR LOAD

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



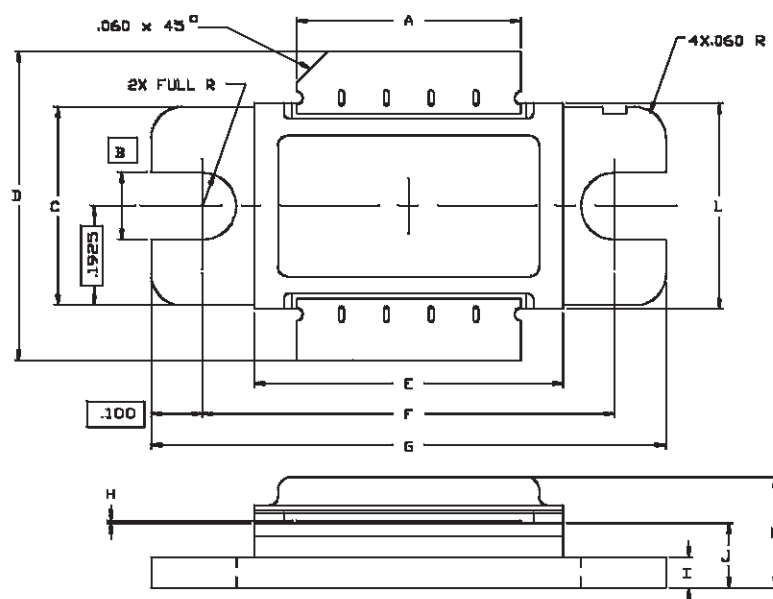
C1 : 0.8-8.0 pf Johanson Gigatrim
 C2 : 0.6-4.5 pf Johanson Gigatrim
 C3,C4 : 100 pf Chips
 C5 : 47 pf Chip
 C6 : 10 uF Tantalum, 50 V
 C7 : 100 uF Electrolytic, 63 V
 L1,L2 : Straps 0.300" long, 0.100" wide
 and 0.005" thick
 L3 : 3 Turns #24 wire, 0.085" ID
 Substrate : Er=10.2 H=0.025"

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			

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