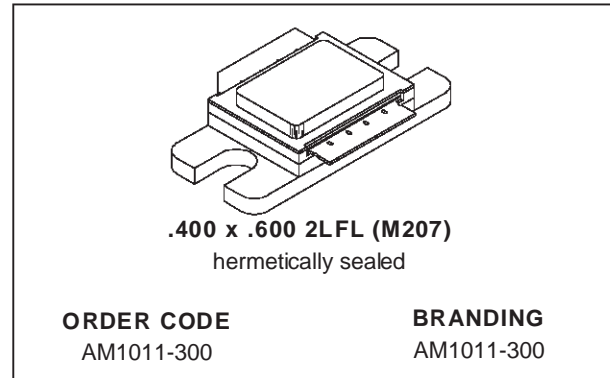


## RF & MICROWAVE TRANSISTORS AVIONICS APPLICATIONS

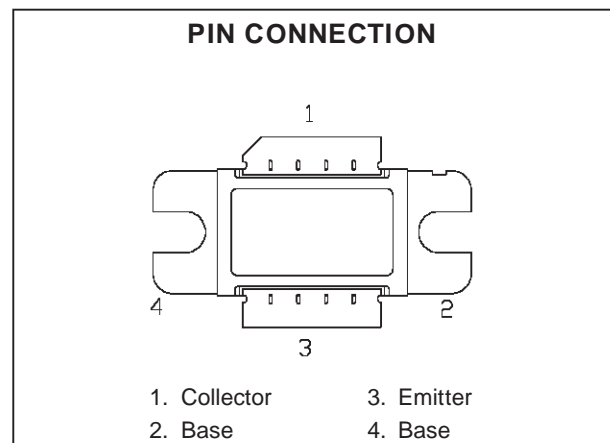
- REFRACTORY/GOLD METALLIZATION
- EMITTER SITE BALLASTING
- LOW RF THERMAL RESISTANCE
- INPUT/OUTPUT MATCHING
- OVERLAY GEOMETRY
- METAL/CERAMIC HERMETIC PACKAGE
- P<sub>OUT</sub> = 325 W MIN. WITH 7.7 dB GAIN
- 1030/1090 MHZ OPERATION



### 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<sub>case</sub> = 25°C)

Symbol	Parameter	Value	Unit
P <sub>DISS</sub>	Power Dissipation (T <sub>C</sub> ≤ 100°C)*	1070	W
I <sub>C</sub>	Device Current*	36	A
V <sub>CC</sub>	Collector-Supply Voltage*	43	V
T <sub>J</sub>	Junction Temperature (Pulsed RF operation)	+250	°C
T <sub>STG</sub>	Storage Temperature	- 65 to +200	°C

### THERMAL DATA

R <sub>TH(j-c)</sub>	Junction-Case Thermal Resistance*	0.14	°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.	
$BV_{\text{CBO}}$	$I_{\text{C}} = 75 \text{ mA}$	$I_{\text{E}} = 0 \text{ mA}$	65	—	—	V
$BV_{\text{CES}}$	$I_{\text{C}} = 75 \text{ mA}$	$V_{\text{BE}} = 0 \text{ V}$	65	—	—	V
$BV_{\text{EBO}}$	$I_{\text{C}} = 25 \text{ mA}$	$I_{\text{C}} = 0 \text{ mA}$	3.0	—	—	V
$I_{\text{CES}}$	$V_{\text{CE}} = 40 \text{ V}$	$V_{\text{BE}} = 0 \text{ V}$	—	—	30	mA
$h_{\text{FE}}$	$V_{\text{CE}} = 5 \text{ V}$	$I_{\text{C}} = 10 \text{ A}$	10	—	—	—

## DYNAMIC

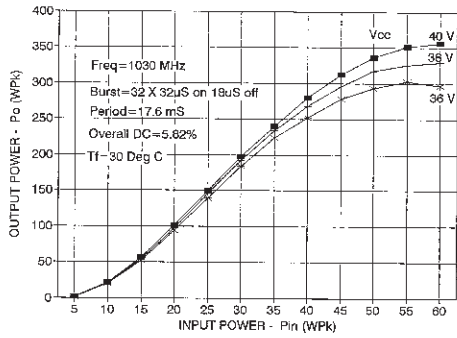
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
$P_{\text{OUT}}$	$f = 1090 \text{ MHz}$	$P_{\text{IN}} = 55 \text{ W}$	$V_{\text{CC}} = 40 \text{ V}$	325	350	—	W
hc	$f = 1090 \text{ MHz}$	$P_{\text{OUT}} = 325 \text{ W}$	$V_{\text{CC}} = 40 \text{ V}$	40	45	—	%
GP	$f = 1090 \text{ MHz}$	$P_{\text{OUT}}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

Pulse Conditions: Pulse width = 200 $\mu\text{s}$ , Duty Cycle = 5%, are equivalent to the following pulse burst conditions:

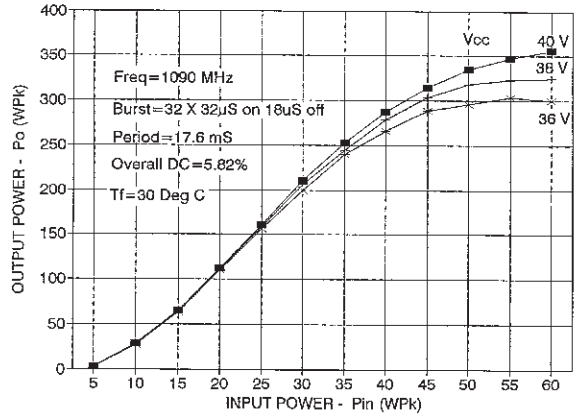
Mode-S Interrogator (freq = 1030MHz)  
 32 pulses, 32 $\mu\text{s}$  on, 18 $\mu\text{s}$  off, burst period = 17.6ms  
 long term duty = 5.82%

TYPICAL PERFORMANCE

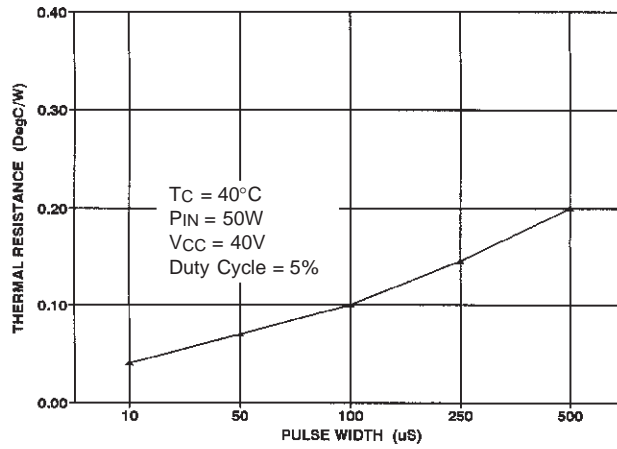
POWER OUTPUT vs POWER INPUT @ 1030 MHz



POWER OUTPUT vs POWER INPUT @ 1090 MHz

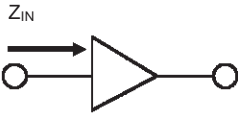


MAXIMUM THERMAL RESISTANCE vs PULSE WIDTH

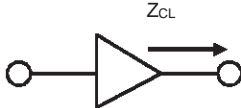


IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE



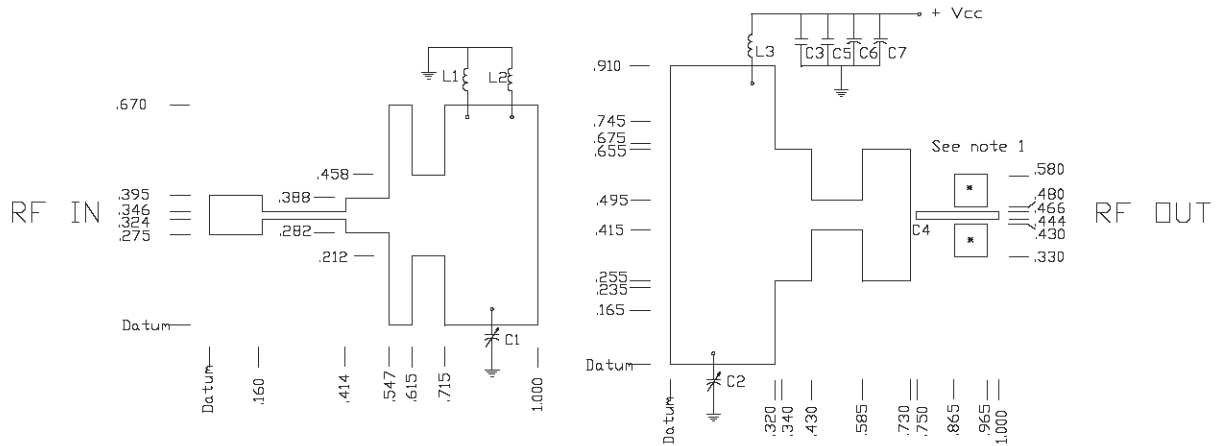
TYPICAL COLLECTOR LOAD



FREQ.	Z <sub>IN</sub> (Ω)	Z <sub>CL</sub> (Ω)
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<sub>IN</sub> = 55W

TEST CIRCUIT

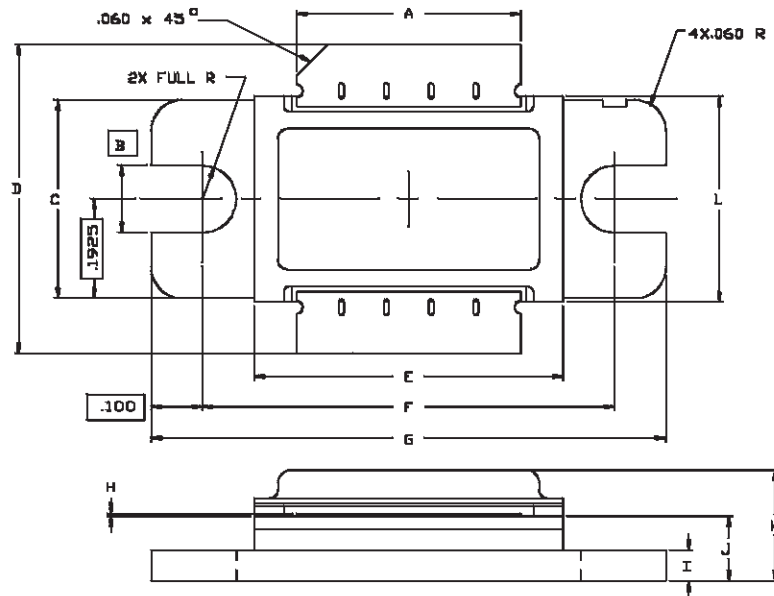


- C1 : 0.8-8.0 pf Johanson Gigatrim
- C2 : 0.6-4.5 pf Johanson Gigatrim
- C3,C4 : 100 pf Chips
- C5 : 47 pf Chip
- C6 : 10 uF Tantalum, 50 V
- C7 : 100 uF Electrolytic, 63 V
- L1,L2 : Straps 0.300" long, 0.100" wide and 0.005" thick
- L3 : 3 Turns #24 wire, 0.085" ID
- Substrate : Er=10.2 H=0.025"

- 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	.006/0,13			
I	.055/1,40	.065/1,65			
J	.115/2,92	.130/3,30			

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