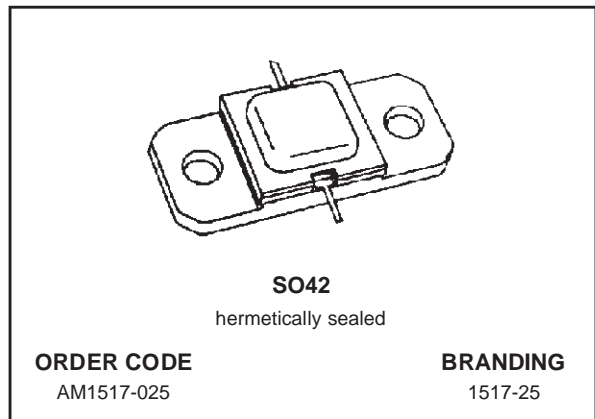




AM1517-025

RF & MICROWAVE TRANSISTORS SATELLITE COMMUNICATIONS APPLICATIONS

- REFRACTORY/GOLD METALLIZATION
- EMITTER SITE BALLASTED
- ∞:1 VSWR CAPABILITY
- LOW THERMAL RESISTANCE
- INPUT/OUTPUT MATCHING
- OVERLAY GEOMETRY
- METALLIC/CERAMIC HERMETIC PACKAGE
- P_{OUT} = 25 W MIN. WITH 8.5 dB GAIN

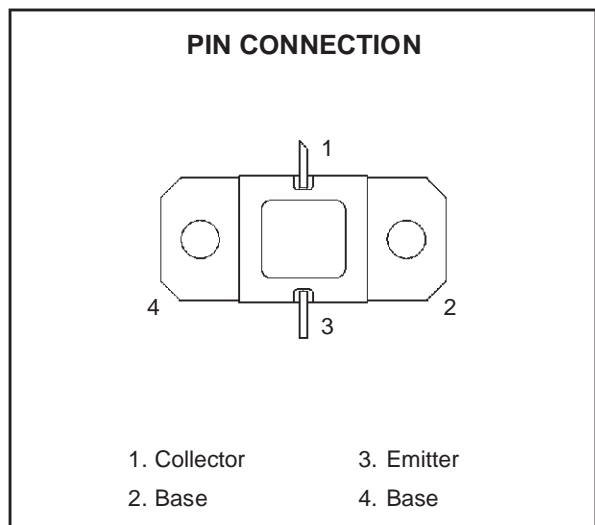


DESCRIPTION

The AM1517-025 power transistor is designed specifically for Satellite communications applications in the 1.5 - 1.7 frequency range.

The device is capable of withstanding any mismatch load condition at any phase angle (VSWR ∞:1) under full rated conditions. The unit is an overlay, emitter site ballasted, geometry utilizing a refractory/Gold metallization system.

The AM1517-025 is supplied in the AMPAC™ Hermetic/Ceramic package with internal Input/Output matching structures.



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

Symbol	Parameter	Value	Unit
P _{DISS}	Power Dissipation* (T _C ≤ 50 °C)	45	W
I _C	Device Current*	2.5	A
V _{CC}	Collector-Supply Voltage*	30	V
T _j	Junction Temperature	200	°C
T _{STG}	Storage Temperature	-65 to +200	°C

THERMAL DATA

R _{th(j-c)}	Junction-Case Thermal Resistance*	3.3	°C/W
----------------------	-----------------------------------	-----	------

* Applies only to rated RF amplifier operation

ELECTRICAL SPECIFICATION($T_{CASE} = 25^{\circ}C$)

STATIC

Symbol	Parameter	Min.	Typ.	Max.	Unit
BV _{CBO}	I _C = 8 mA I _E = 0 mA	45	---	---	V
BV _{EBO}	I _E = 8 mA I _C = 0 mA	3.0	---	---	V
I _{CBO}	V _{CB} = 28 V	---	---	2	mA
h _{FE}	V _{CE} = 5 V I _C = 1.6 A	15	---	150	---

REF. 1015989D

DYNAMIC

Symbol	Parameter	Min.	Typ.	Max.	Unit
P _{OUT}	f = 1.5 - 1.7 GHz P _{IN} = 3.5 W V _{CC} = 28 V	25	---	---	W
η _D	f = 1.5 - 1.7 GHz P _{IN} = 3.5 W V _{CC} = 28 V	50	--	---	%
G _P	f = 1.5 - 1.7 GHz P _{IN} = 3.5 W V _{CC} = 28 V	8.5	---	---	dB

Note: AM1517 series vary P_{IN} to achieve P_{OUT}; performance guaranteed in 50 MHz increments.

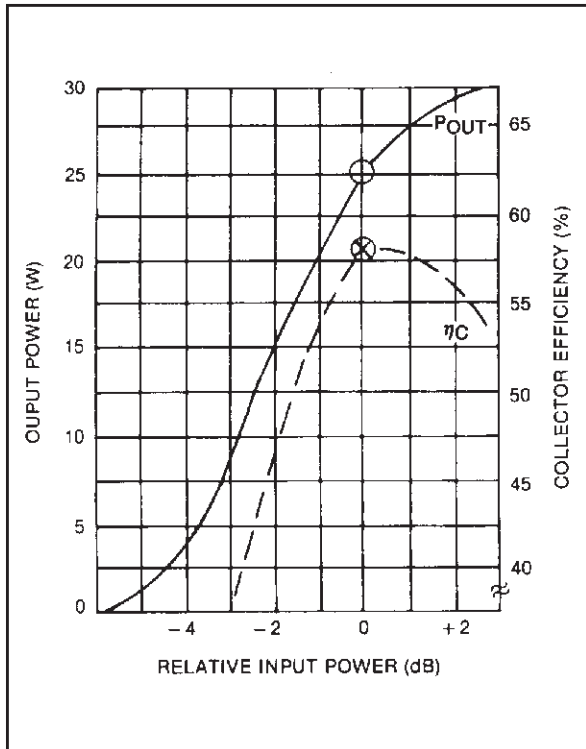
Alpha-Suffix added to AM1517 P/N designates band segment.

M - 1620 - 1660 MHz

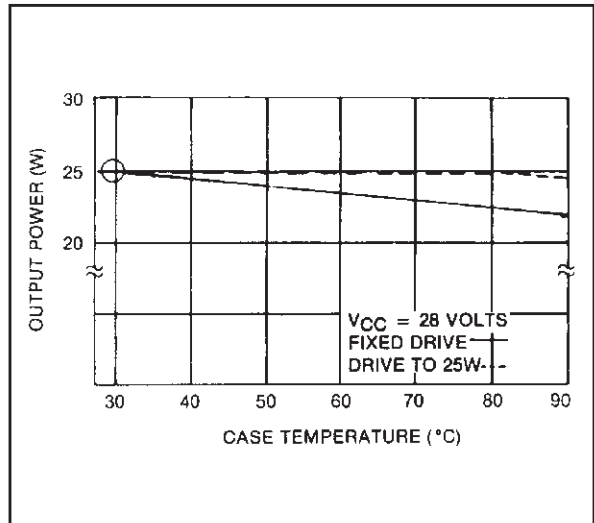
S - 1625 - 1675 MHz

TYPICAL PERFORMANCE

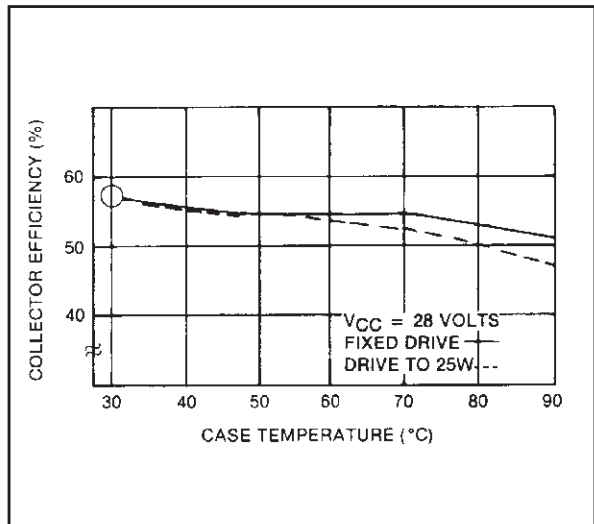
Output Power & Collector Efficiency vs Input Power



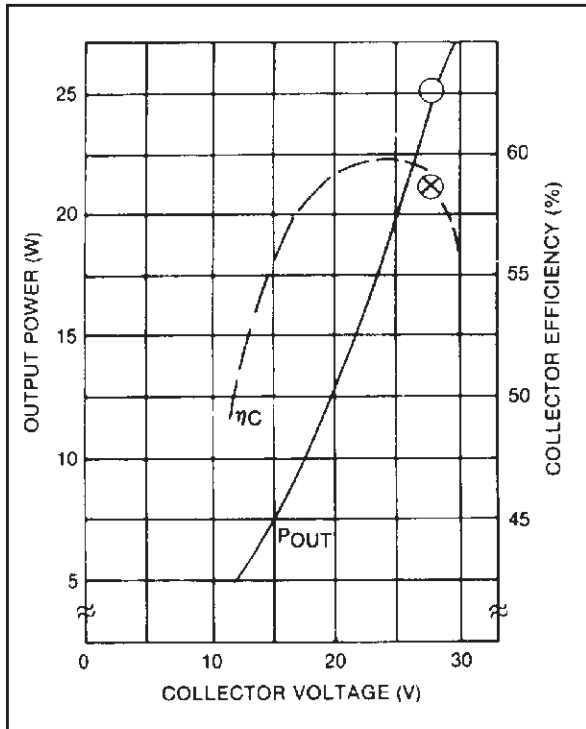
Output Power vs Case Temperature



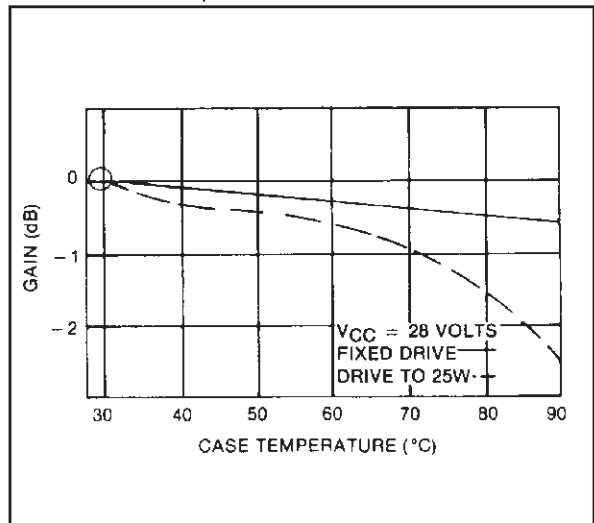
Collector Efficiency vs Case Temperature



Output Power & Collector Efficiency vs Collector Voltage

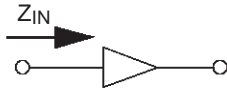


Gain vs Case Temperature

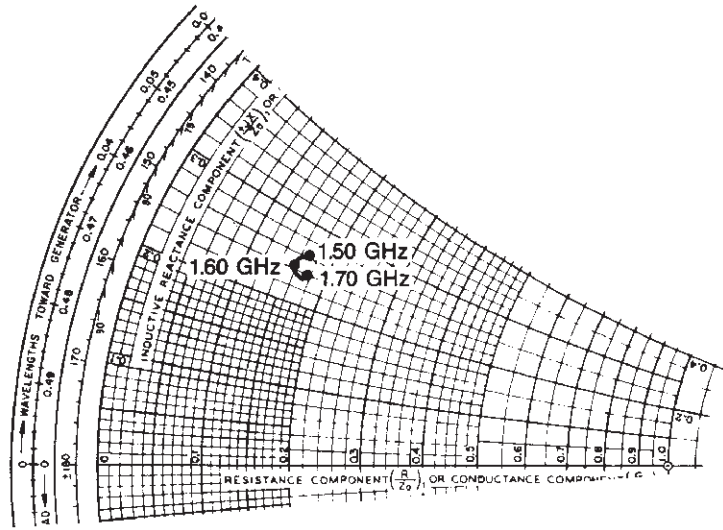


IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE

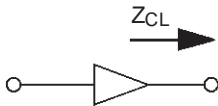


$P_{OUT} = 25\text{ W}$
 $V_{CC} = 28\text{ V}$
 $Z_0 = 50\text{ OHMS}$

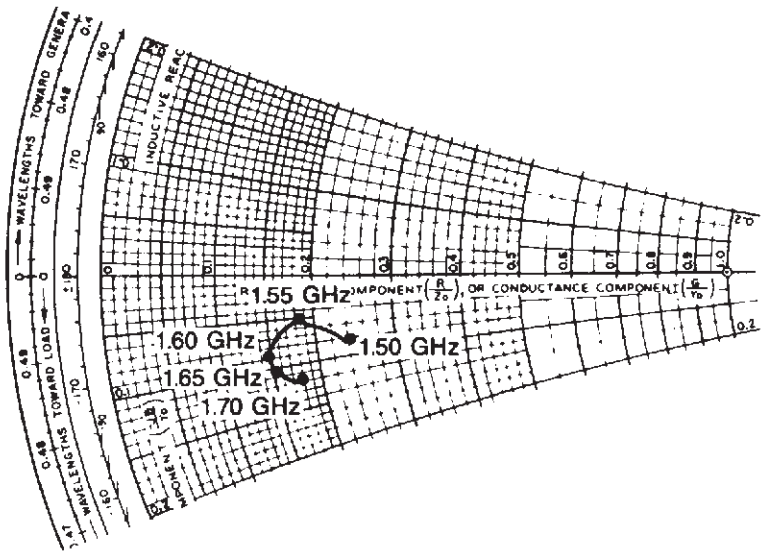


Frequency MHz	Z_{IN} (Ω)	Z_{CL} (Ω)
1.5 GHz	$8.5 + j 13.0$	$12.0 - j 4.0$
1.6 GHz	$8.0 + j 12.5$	$7.5 - j 4.5$
1.7 GHz	$9.0 + j 12.0$	$9.0 - j 6.0$

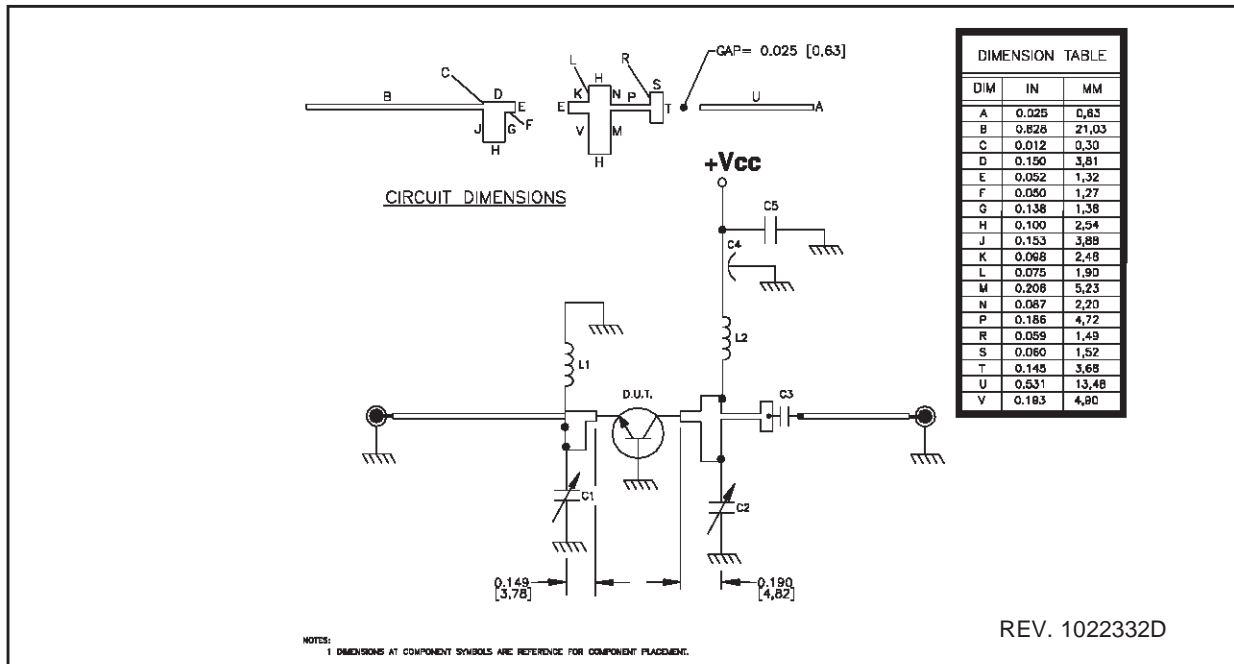
TYPICAL COLLECTOR LOAD IMPEDANCE



$P_{OUT} = 25\text{ W}$
 $V_{CC} = 28\text{ V}$
 $Z_0 = 50\text{ OHMS}$



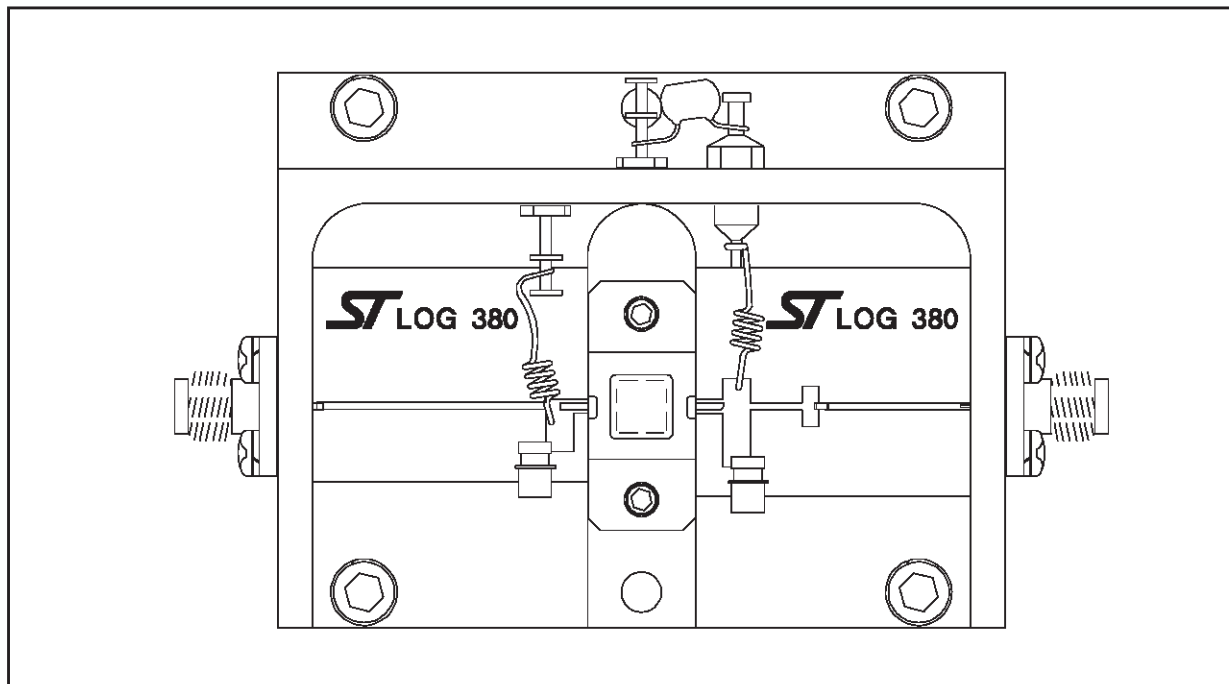
TEST CIRCUIT SCHEMATIC



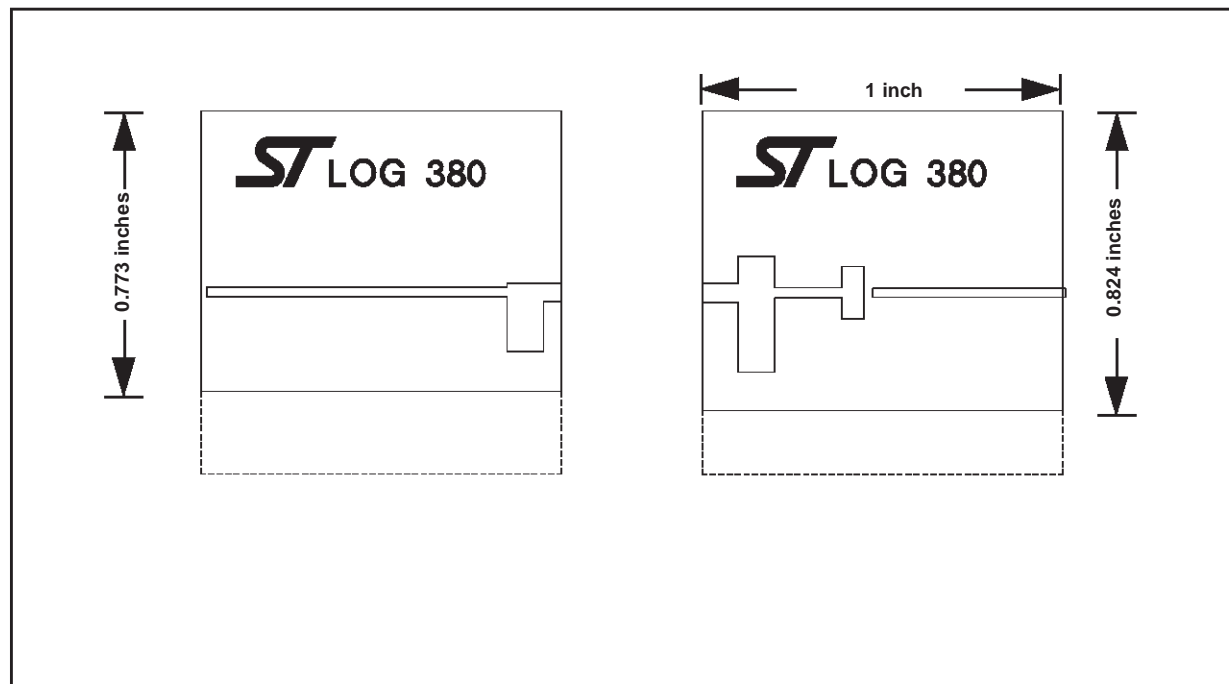
TEST CIRCUIT COMPONENT PART LIST

C1,C2	0.4-2.5pF GIGA TRIM VARIABLE CAPACITOR
C3	100pF SURFACE MOUNT CERAMIC CHIP CAPACITOR
C4	1000pF RESIN SEALED # 8-35 THREADED FEEDTHRU CAPACITOR
C5	0.1 μ F/50v CERAMIC MOLDED RADIAL LEAD CAPACITOR
L1	3 TURN AIR WOUND COIL #26AWG, ID. 0.070 [1.77] BUS BAR WIRE
L2	3 TURN AIR WOUND COIL #26AWG, ID. 0.070 [1.77] BUS BAR WIRE
BOARD	ALUMINA CERAMIC SUBSTRATE, HIGH POLISHED 1.0" SQ [25.40], 0.025" [0.63] THK. $\epsilon_r=9.6$, 200 MICRONS Au, BOTH SIDES

TEST CIRCUIT

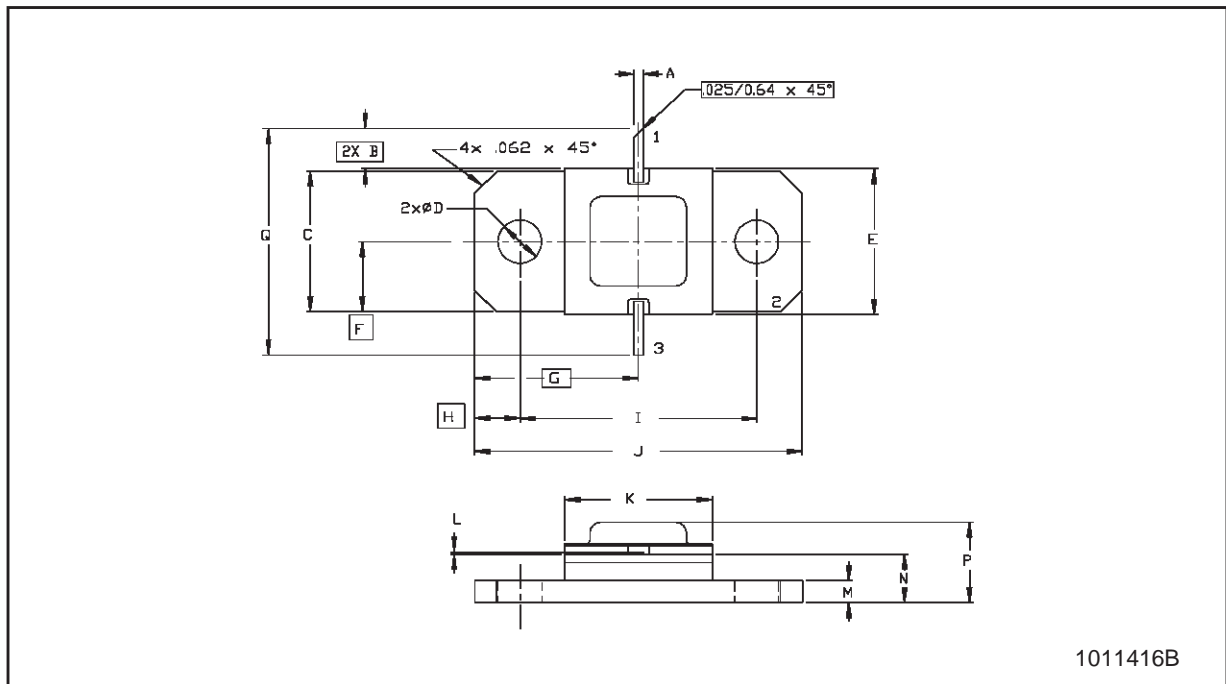


TEST CIRCUIT PHOTOMASTER



SO42 (.400 X .400 2/L HERM W/FLG) MECHANICAL DATA

DIM.	mm			Inch		
	MIN.	TYP.	MAX	MIN.	TYP.	MAX
A	0.51		0.76	.020		.030
B		6.35			.250	
C	9.55		10.06	.376		.396
D	2.79		3.30	.110		.130
E	10.03		10.34	.395		.407
F		4.90			.193	
G		11.43			.450	
H		3.18			.125	
I	16.26		16.76	.640		.660
J	22.61		23.11	.890		.910
K	10.03		10.54	.395		.415
L	0.10		0.18	.004		.006
M	1.32		1.83	.052		.072
N	2.84		3.35	.112		.132
P			5.84			.230
Q	22.35		23.37	.880		.920



Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is registered trademark of STMicroelectronics,
2000 STMicroelectronics - All Rights Reserved

All other names are the property of their respective owners.

STMicroelectronics GROUP OF COMPANIES
Australia - Brazil - China - Finland - France - Germany - Hong Kong - India - Italy - Japan - Malaysia - Malta - Morocco -
Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.

<http://www.st.com>