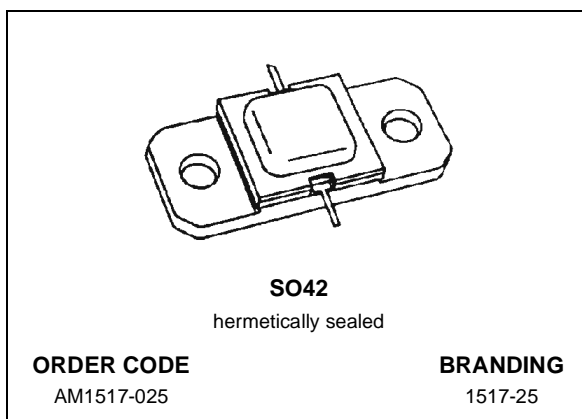




# AM1517-025

## RF & MICROWAVE TRANSISTORS SATELLITE COMMUNICATIONS APPLICATIONS

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

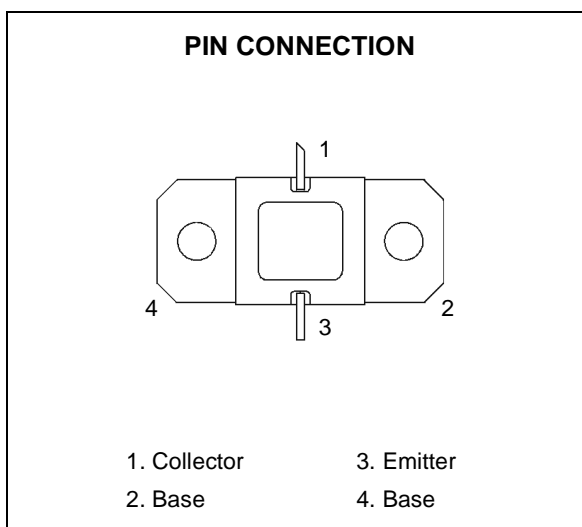


### DESCRIPTION

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  $\infty:1$ ) 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 ( $T_{CASE} = 25\text{ }^{\circ}\text{C}$ )

Symbol	Parameter	Value	Unit
$P_{DISS}$	Power Dissipation* ( $T_c \leq 50\text{ }^{\circ}\text{C}$ )	45	W
$I_C$	Device Current*	2.5	A
$V_{CC}$	Collector-Supply Voltage*	30	V
$T_j$	Junction Temperature	200	$^{\circ}\text{C}$
$T_{STG}$	Storage Temperature	-65 to +200	$^{\circ}\text{C}$

### THERMAL DATA

$R_{th(j-c)}$	Junction-Case Thermal Resistance*	3.3	$^{\circ}\text{C/W}$
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\* Applies only to rated RF amplifier operation

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

**STATIC**

Symbol	Parameter	Min.	Typ.	Max.	Unit
$BV_{CBO}$	$I_C = 8\text{ mA}$ $I_E = 0\text{ mA}$	45	---	---	V
$BV_{EBO}$	$I_E = 8\text{ mA}$ $I_C = 0\text{ mA}$	3.0	---	---	V
$I_{CBO}$	$V_{CB} = 28\text{ V}$	---	---	2	mA
$h_{FE}$	$V_{CE} = 5\text{ V}$ $I_C = 1.6\text{ A}$	15	---	150	---

REF. 1015989D

**DYNAMIC**

Symbol	Parameter	Min.	Typ.	Max.	Unit
$P_{OUT}$	$f = 1.5 - 1.7\text{ GHz}$ $P_{IN} = 3.5\text{ W}$ $V_{CC} = 28\text{ V}$	25	---	---	W
$\eta_D$	$f = 1.5 - 1.7\text{ GHz}$ $P_{IN} = 3.5\text{ W}$ $V_{CC} = 28\text{ V}$	50	--	---	%
$G_P$	$f = 1.5 - 1.7\text{ GHz}$ $P_{IN} = 3.5\text{ W}$ $V_{CC} = 28\text{ V}$	8.5	---	---	dB

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

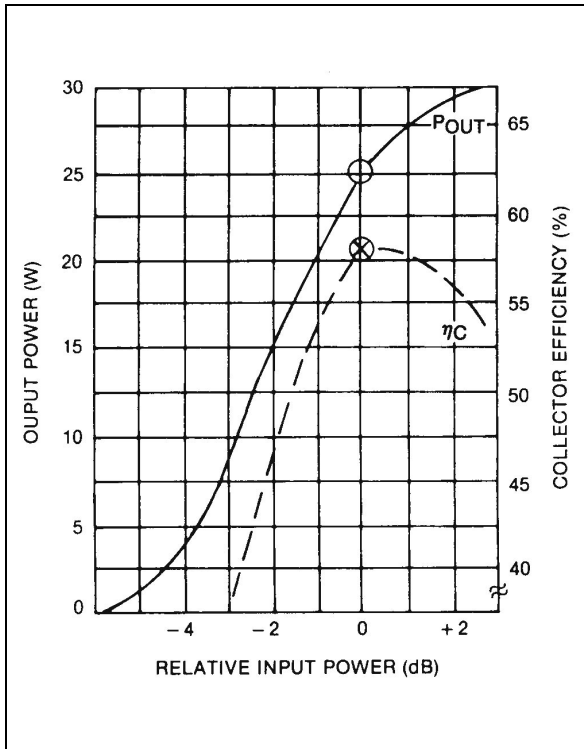
Alpha-Suffix added to AM1517 P/N designates band segment.

M - 1620 - 1660 MHz

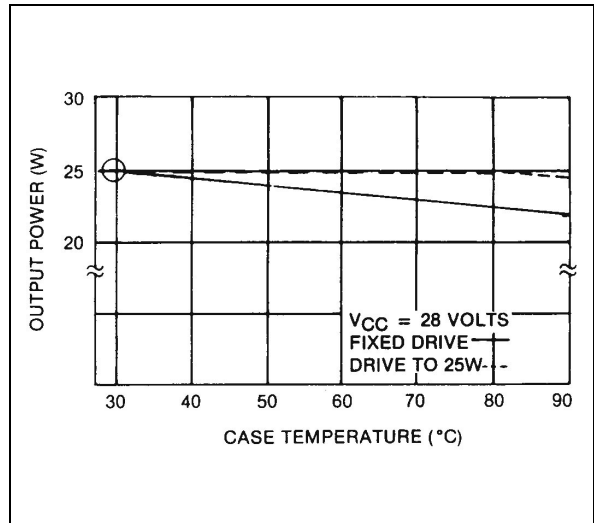
S - 1625 - 1675 MHz

TYPICAL PERFORMANCE

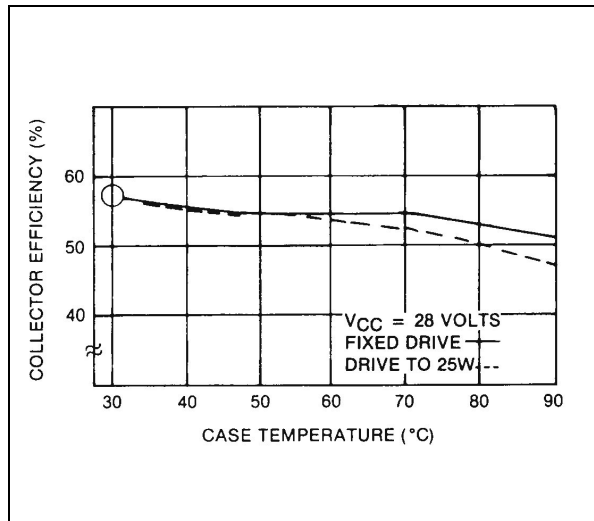
Output Power & Collector Efficiency vs Input Power



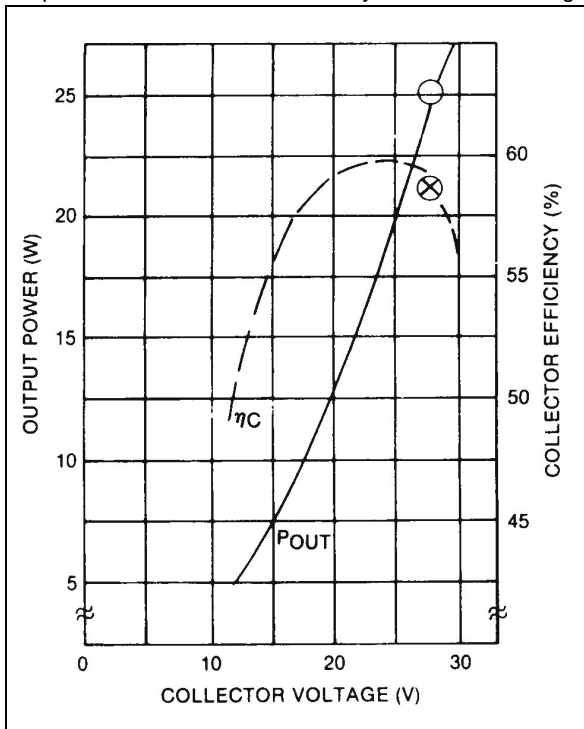
Output Power vs Case Temperature



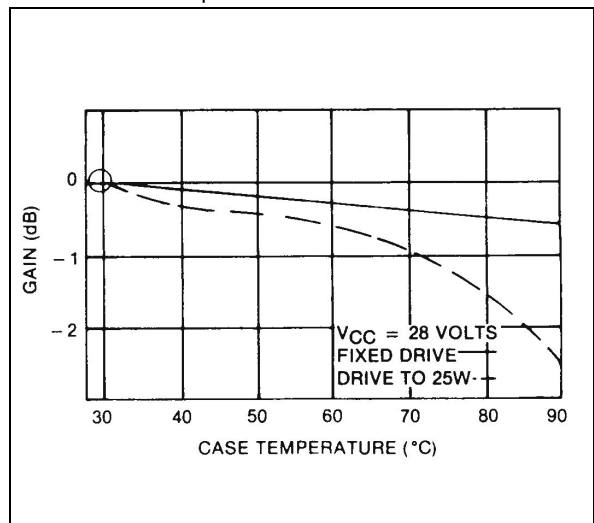
Collector Efficiency vs Case Temperature



Output Power & Collector Efficiency vs Collector Voltage

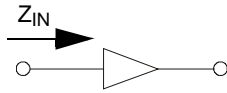


Gain vs Case Temperature

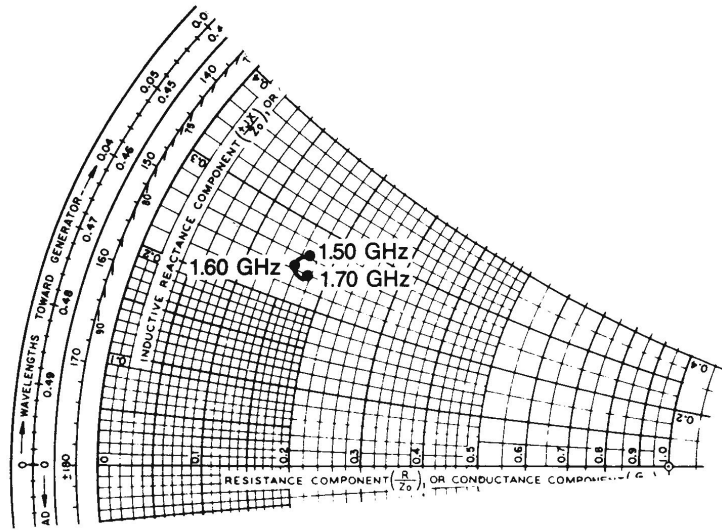


IMPEDANCE DATA

TYPICAL INPUT IMPEDANCE

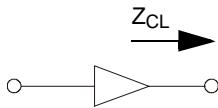


$P_{OUT} = 25\text{ W}$   
 $V_{CC} = 28\text{ V}$   
 $Z_0 = 50\text{ OHMS}$

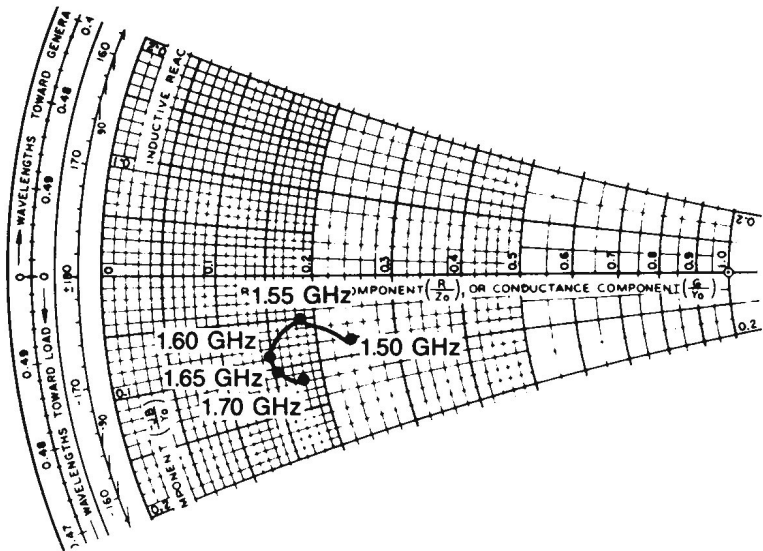


Frequency MHz	$Z_{IN}$ ( $\Omega$ )	$Z_{CL}$ ( $\Omega$ )
1.5 GHz	$8.5 + j 13.0$	$12.0 - j 4.0$
1.6 GHz	$8.0 + j 12.5$	$7.5 - j 4.5$
1.7 GHz	$9.0 + j 12.0$	$9.0 - j 6.0$

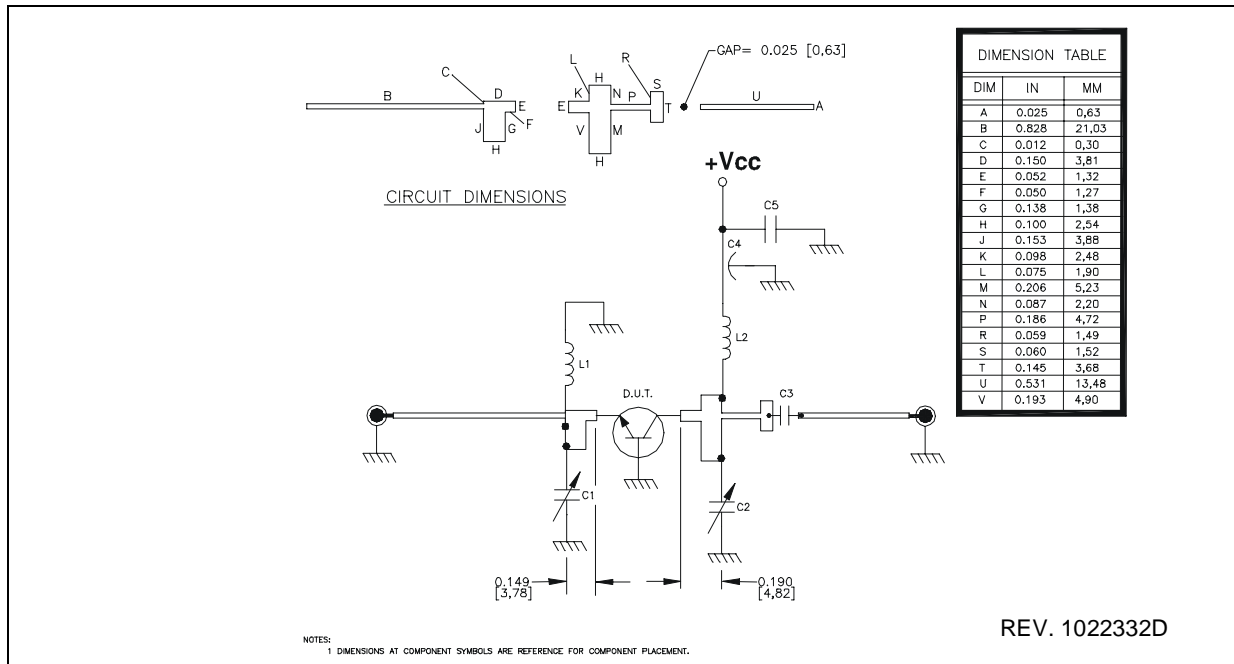
TYPICAL COLLECTOR LOAD IMPEDANCE



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



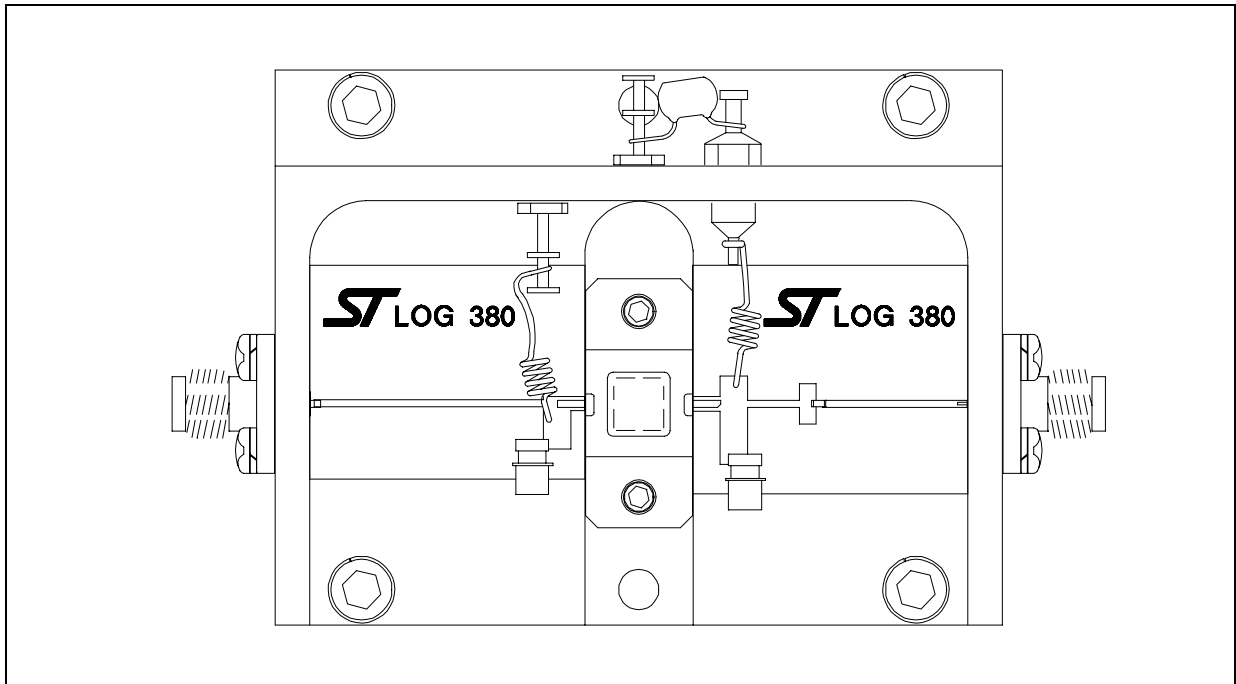
## TEST CIRCUIT SCHEMATIC



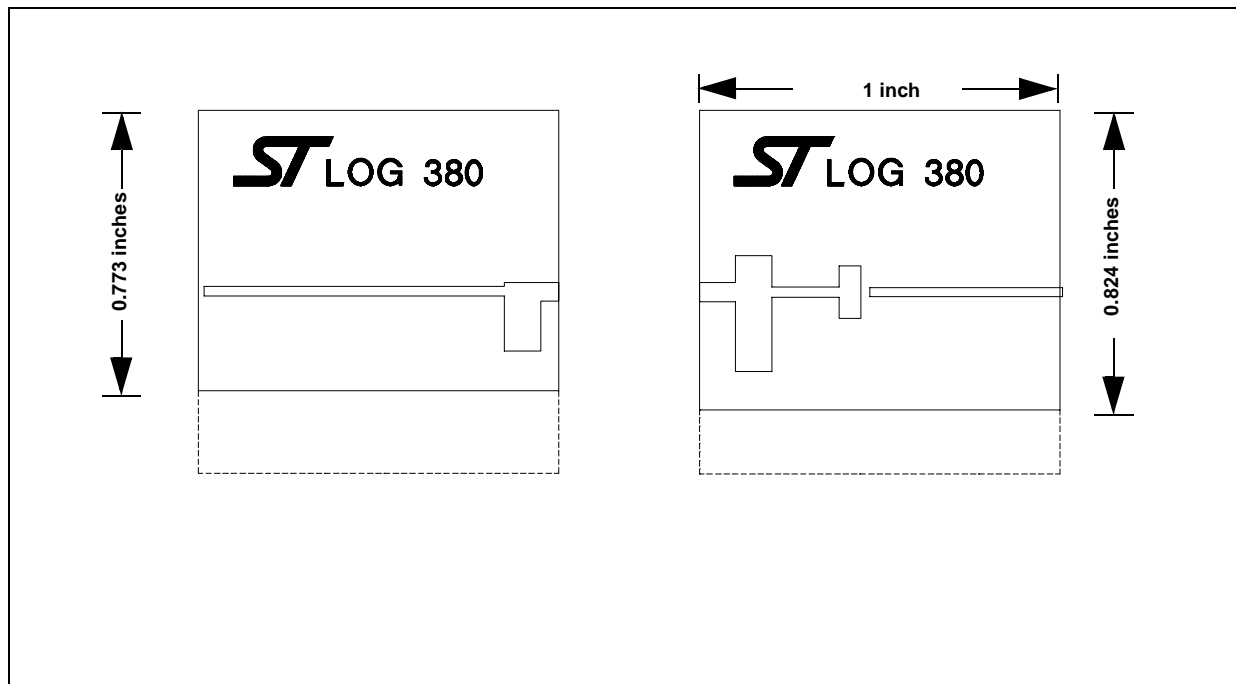
## TEST CIRCUIT COMPONENT PART LIST

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 $\mu$ 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 MICROINCHES Au, BOTH SIDES

TEST CIRCUIT

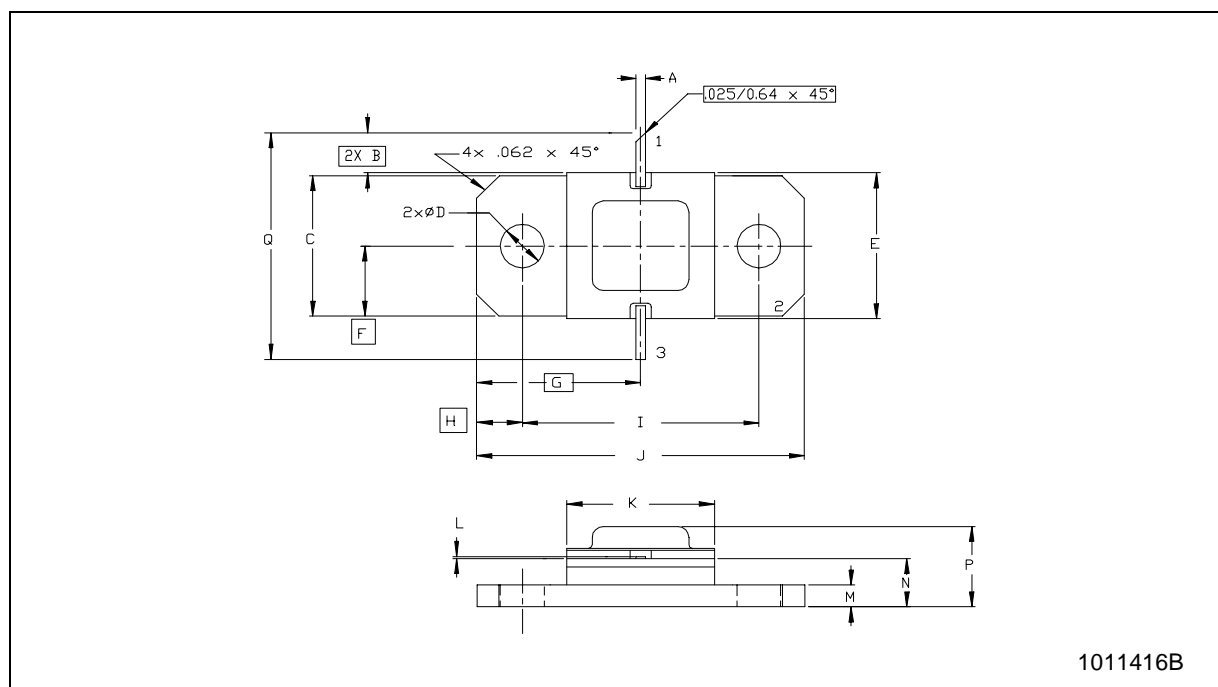


TEST CIRCUIT PHOTOMASTER



## 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



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