



## SD1732 (TDS595)

### RF POWER BIPOLAR TRANSISTORS TV LINEAR APPLICATIONS

#### FEATURES SUMMARY

- 470 - 860 MHz
- 25 VOLTS
- CLASS A PUSH PULL
- DESIGNED FOR HIGH POWER LINEAR OPERATION
- HIGH SATURATED POWER CAPABILITY
- GOLD METALLIZATION
- DIFFUSED EMITTER BALLAST RESISTORS
- COMMON EMITTER CONFIGURATION
- INTERNAL INPUT MATCHING
- $P_{OUT} = 14.0 \text{ W MIN. WITH } 8.5 \text{ dB GAIN}$

#### DESCRIPTION

The SD1732 is a gold metallized epitaxial silicon NPN planar transistor using diffused emitter ballast resistors for high linearity Class A operation in UHF and Band IV, V television transmitters and transposes.

Figure 1. Package

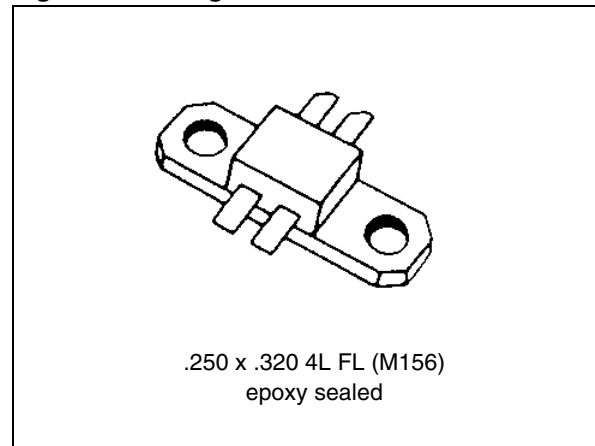


Figure 2. Pin Connection

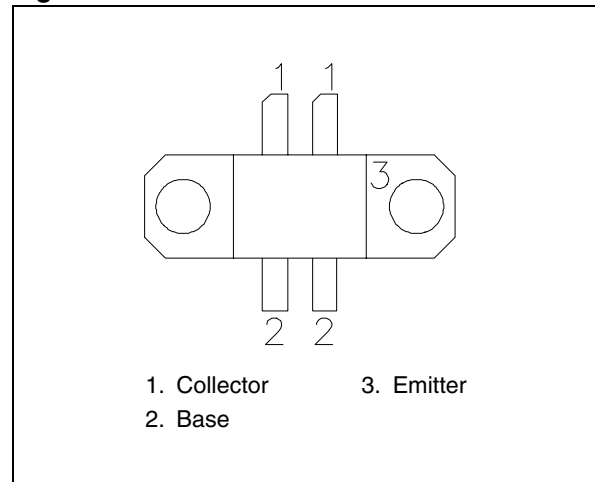


Table 1. Order Codes

Order Codes	Marking	Package	Packaging
SD1732 (TDS595)	SD1732	M156	BLACK CARDBOARDS

## SD1732 (TDS595)

**Table 2. Absolute Maximum Ratings ( $T_{case} = 25^{\circ}C$ )**

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage	45	V
$V_{CEO}$	Collector-Emitter Voltage	25	V
$V_{EBO}$	Emitter-Base Voltage	4.0	V
$I_C$	Device Current	2 x 2.6	A
$P_{DISS}$	Power Dissipation	65	W
$T_J$	Junction Temperature	+200	$^{\circ}C$
$T_{STG}$	Storage Temperature	- 65 to +150	$^{\circ}C$

**Table 3. Thermal Data**

Symbol	Parameter	Value	Unit
$R_{TH(j-c)}$	Junction-Case Thermal Resistance	2.5	$^{\circ}C/W$

## ELECTRICAL SPECIFICATIONS ( $T_{case} = 25^{\circ}C$ )

**Table 4. Static**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$BV_{CBO}$	$I_C = 20\text{ mA}; I_E = 0\text{ mA}$	45	—	—	V
$BV_{CEO}$	$I_C = 40\text{ mA}; I_B = 0\text{ mA}$	25	—	—	V
$BV_{EBO}$	$I_E = 5\text{ mA}; I_C = 0\text{ mA}$	3.0	—	—	V
$h_{FE}$	$V_{CE} = 20\text{ V}; I_C = 0.5\text{ A}$	10	—	—	—

**Table 5. Dynamic**

Symbol	Test Conditions	Value			Unit
		Min.	Typ.	Max.	
$P_{OUT}$	$f = 845\text{ MHz}; V_{CE} = 25\text{ V}; I_{CQ} = 2 \times 850\text{ mA}$	14	—	—	W
$G_P$	$P_{OUT} = 14\text{ W}; V_{CE} = 25\text{ V}; I_{CQ} = 2 \times 850\text{ mA}$	8.5	—	—	dB
$IMD_3^{(1)}$	$P_{OUT} = 14\text{ W}; V_{CE} = 25\text{ V}; I_{CQ} = 2 \times 850\text{ mA}$	—	-47	—	dBc
$CMD^{(2)}$	$P_{OUT} = 14\text{ W}; V_{CE} = 25\text{ V}; I_{CQ} = 2 \times 850\text{ mA}$	—	20	—	%
$C_{OB}$	$f = 1\text{ MHz}; V_{CB} = 25\text{ V}$	—	—	20	pF

Note: 1. IMD 3 Tone Testing

Vision Carrier -8 dB ref

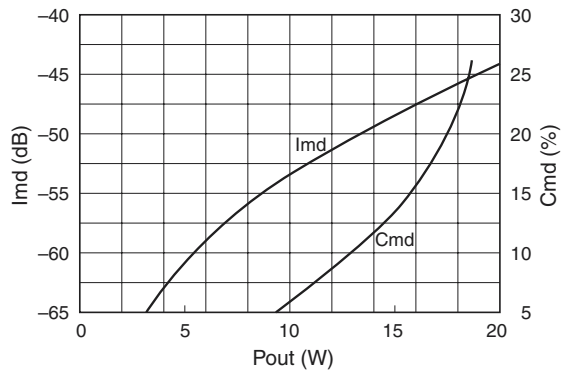
Sound Carrier -7 dB ref

Sideband Carrier -16 dB ref

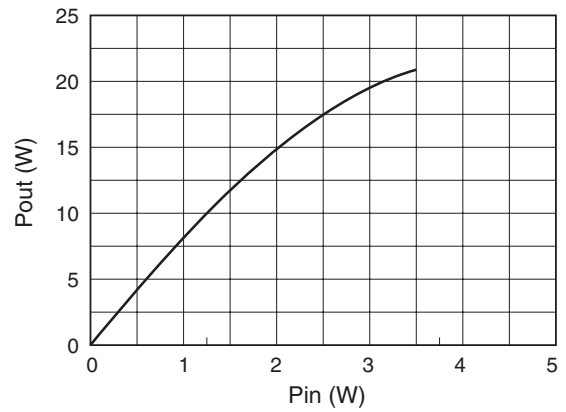
2. CMD: Cross Modulation Distortion of the Voltage Variation (%) of Sound Carrier When Vision Carrier is Switched from 0 to -20 dB

## TYPICAL PERFORMANCE

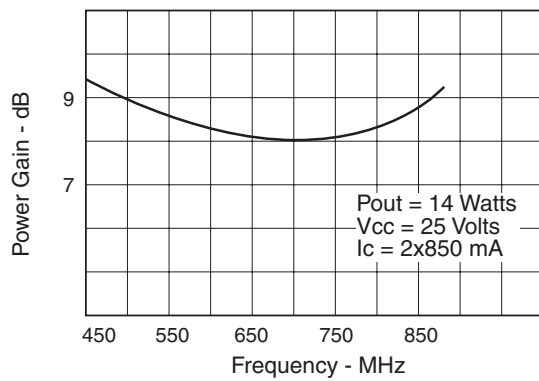
**Figure 3. Intermodulation Distortion & Cross Modulation Distortion vs Power Output**



**Figure 4. Power Output vs Power Input**



**Figure 5. Broadband Power Gain vs Frequency**



**Figure 6. Thermal Resistance vs Case Temperature**

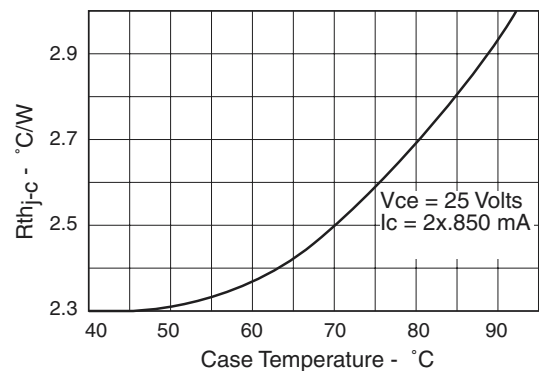
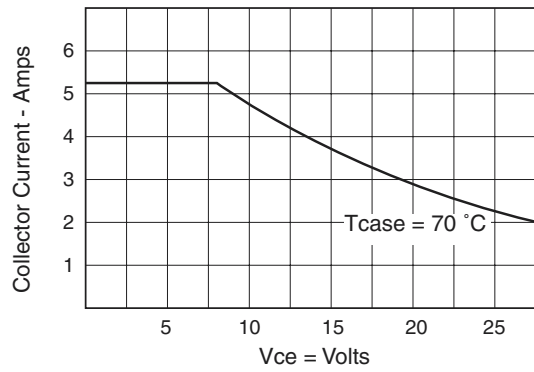
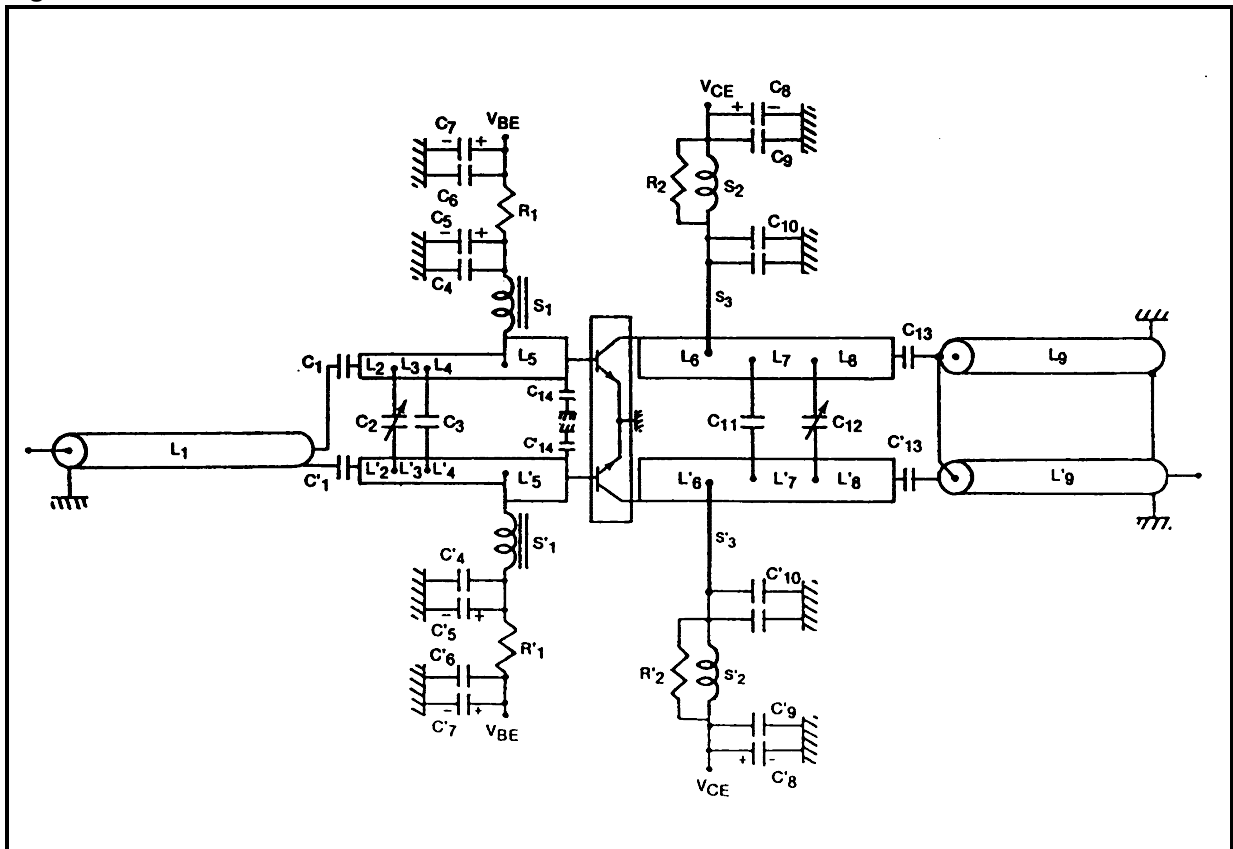


Figure 7. Safe Operating Area



## TEST CIRCUIT

Figure 8. Test Circuit



## SD1732 (TDS595)

**Table 6. Test Circuit**

C1, C'1, C13, C'13	68pF, ATC 100A
C2	4.5pF Adjustable Johanson
C3	4.7pF, ATC 100A
C4, C'4, C6, C'6, C9, C'9, C10, C'10	100pF, ATC 100A + 1nF LCC Chip + 10nF LCC Chip
C5, C'5,	4.7 $\mu$ F, 25V, Tantalum Capacitor
C7, C'7,	10 $\mu$ F, 25V, Tantalum Capacitor
C8, C'8,	22 $\mu$ F, 35V, Tantalum Capacitor
C11	4.7pf, ATC 100A
C12	8pF Adjustable Johanson
C14, C'14,	22pF, ATC 100A
L1, L9, L'9	50 $\Omega$ Coaxial Wire Diameter 2.2mm, Length 29mm on 70 $\Omega$ Transmission Line
L2, L'2	50 $\Omega$ Printed Transmission Line Length 4mm
L3, L'3	50 $\Omega$ Printed Transmission Line Length 3mm
L4, L'4	50 $\Omega$ Printed Transmission Line Length 9.5mm
L5, L'5	39 $\Omega$ Printed Transmission Line Length 7mm
L6, L'6	39 $\Omega$ Printed Transmission Line Length 15mm
L7, L'7	39 $\Omega$ Printed Transmission Line Length 8mm
L8, L'8	39 $\Omega$ Printed Transmission Line Length 10mm
R1, R'1	4.7 $\Omega$ , 1/2W
R2, R'2	1207 $\Omega$ , 1/2W
S1, S'1	470nH Molded
S2, S'2	5 Turns, Diameter Wire 0.5mm on 3mm I.D.
S3, S'3	Diameter Wire 1.2mm, Length 12mm
Substrate	Teflon Glass 30Mils, Er = 2.55

## SUPPLY CIRCUIT

Figure 9. Supply Circuit - Class A Adjustable (per side)

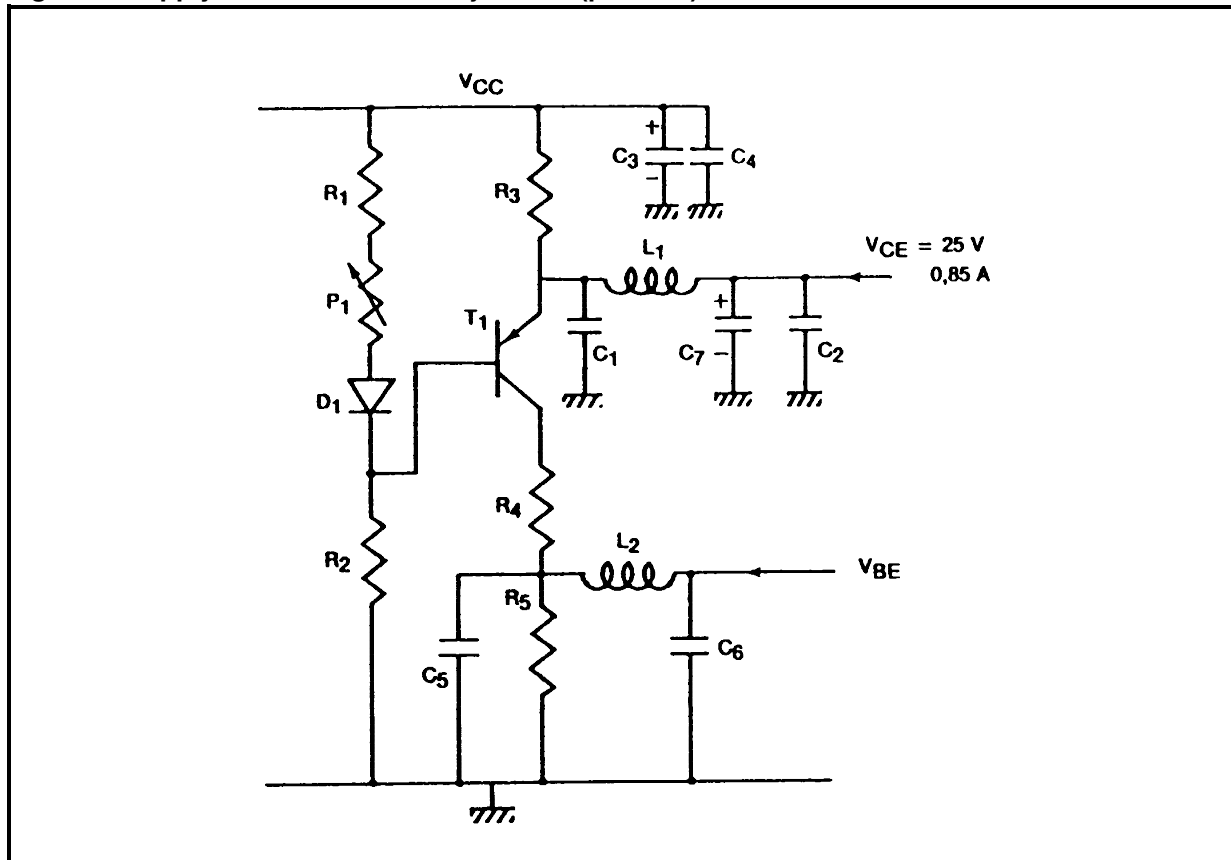
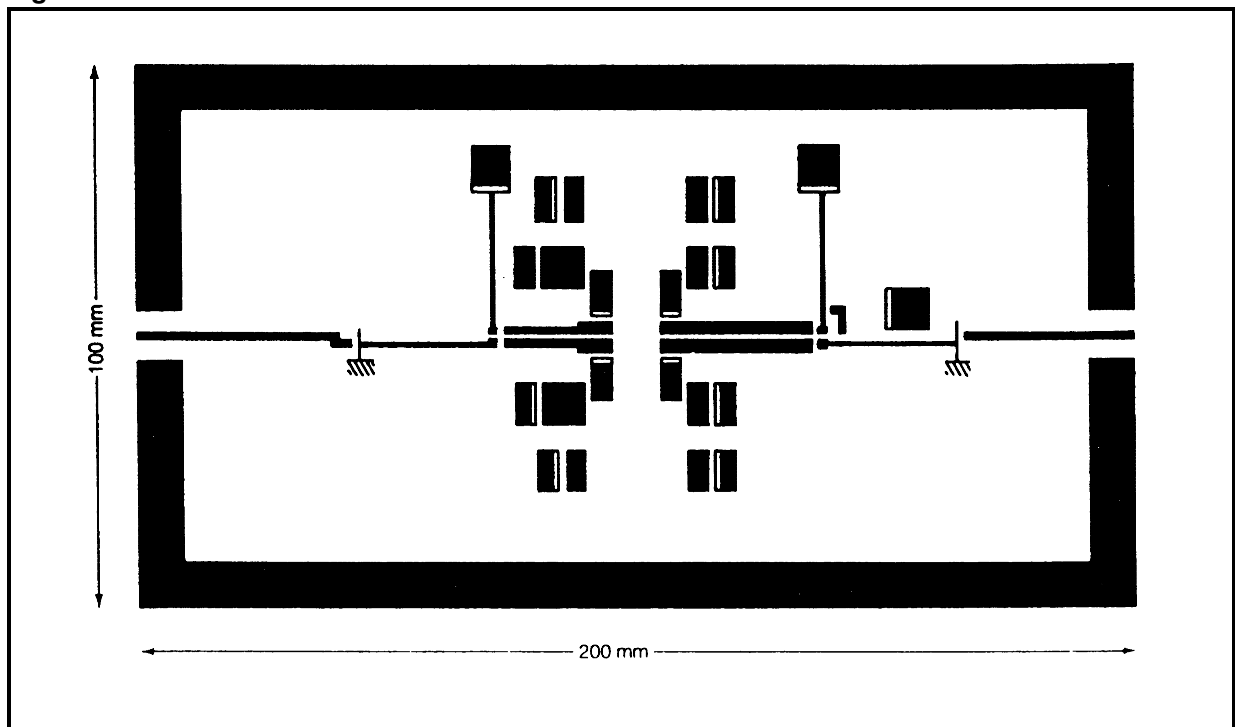


Table 7. Supply Circuit - Class A Adjustable (per side)

C1, C2, C4, C5, C6	1nF LCC Chip + 10nF LCC Chip
C3	100 $\mu$ F Sprague
C7	10 $\mu$ F Sprague
D1	1N 4001
L1, L2	5 Turns, 0.5mmWire on 3mm Internal Diameter
P1	1k $\Omega$
R1	56 $\Omega$ , 1/2W
R2	5600 $\Omega$ , 1/2W
R3	2.2 $\Omega$ , 3W
R4, R5	56 $\Omega$ , 1W
T1	BDX 54 B

PHOTOMASTER OF TEST CIRCUIT

Figure 10. Photomaster of Test Circuit



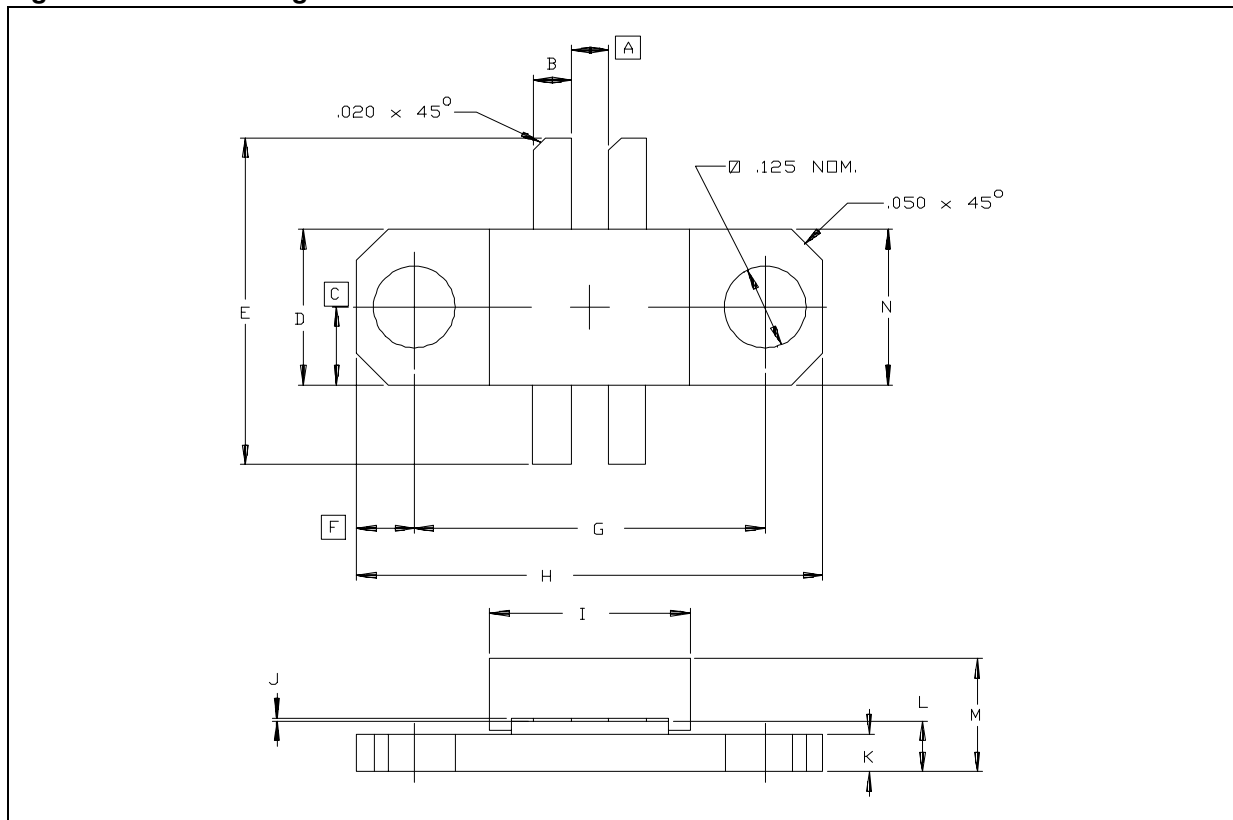


## PACKAGE MECHANICAL

Table 8. M156 Mechanical Data

Symbol	millimeters			inches		
	Min	Typ	Max	Min	Typ	Max
A		1.52			0.060	
B	1.40		1.65	0.055		0.065
C		3.15			0.124	
D	6.17		6.43	0.243		0.253
E	16.13		16.89	0.635		0.665
F		2.34			0.092	
G	14.10		14.35	0.555		0.565
H	18.77		19.02	0.739		0.749
I	8.00		8.31	0.315		0.327
J	0.05		0.15	0.002		0.006
K	1.40		1.65	0.055		0.065
L	1.91		2.41	0.075		0.095
M			4.83			0.190
N	6.22		6.53	0.245		0.257

Figure 11. M156 Package Dimensions



Note: Drawing is not to scale.

**REVISION HISTORY**

**Table 9. Revision History**

<b>Date</b>	<b>Revision</b>	<b>Description of Changes</b>
November-1992	1	First Issue
10-June-2004	2	Stylesheet update. No content change.

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