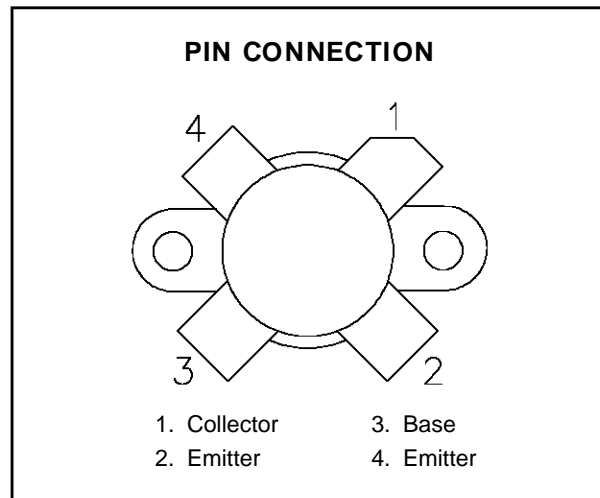
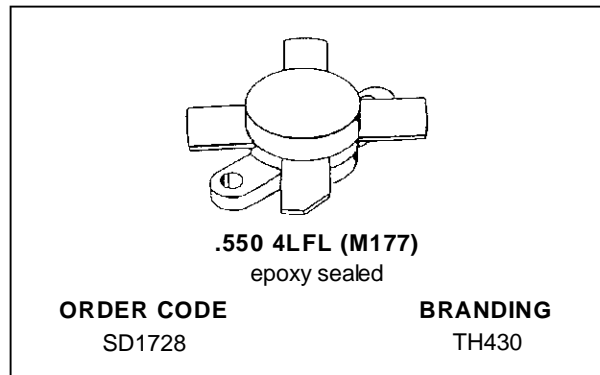


RF & MICROWAVE TRANSISTORS HF SSB APPLICATIONS

- OPTIMIZED FOR SSB
- 30 MHz
- 50 VOLTS
- IMD – 30 dB
- GOLD METALLIZATION
- COMMON EMITTER
- P_{OUT} = 250 W PEP WITH 14.5 dB GAIN



DESCRIPTION

The SD1728 is a 50 V epitaxial silicon NPN planar transistor designed primarily for SSB and VHF communications. This device utilizes emitter ballasting for improved ruggedness and reliability.

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

| Symbol | Parameter | Value | Unit |
|-------------------|---------------------------|--------------|------|
| V _{CB0} | Collector-Base Voltage | 110 | V |
| V _{CEO} | Collector-Emitter Voltage | 55 | V |
| V _{EBO} | Emitter-Base Voltage | 4.0 | V |
| I _c | Device Current | 40 | A |
| P _{DISS} | Power Dissipation | 330 | W |
| T _J | Junction Temperature | +200 | °C |
| T _{STG} | Storage Temperature | - 65 to +150 | °C |

THERMAL DATA

| | | | |
|----------------------|----------------------------------|-----|------|
| R _{TH(j-c)} | Junction-Case Thermal Resistance | 0.4 | °C/W |
|----------------------|----------------------------------|-----|------|

SD1728 (TH430)

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

STATIC

| Symbol | Test Conditions | | Value | | | Unit |
|-------------------|-------------------------------|-----------------------------|-------|------|------|------|
| | | | Min. | Typ. | Max. | |
| BV_{CES} | $I_{\text{C}} = 200\text{mA}$ | $V_{\text{BE}} = 0\text{V}$ | 110 | — | — | V |
| BV_{CEO} | $I_{\text{C}} = 200\text{mA}$ | $I_{\text{B}} = 0\text{mA}$ | 55 | — | — | V |
| BV_{EBO} | $I_{\text{E}} = 20\text{mA}$ | $I_{\text{C}} = 0\text{mA}$ | 4.0 | — | — | V |
| I_{CEO} | $V_{\text{CE}} = 30\text{V}$ | $I_{\text{E}} = 0\text{mA}$ | — | — | 10 | mA |
| I_{CES} | $V_{\text{CE}} = 60\text{V}$ | $I_{\text{E}} = 0\text{mA}$ | — | — | 10 | mA |
| h_{FE} | $V_{\text{CE}} = 6\text{V}$ | $I_{\text{C}} = 10\text{A}$ | 15 | — | 45 | — |

DYNAMIC

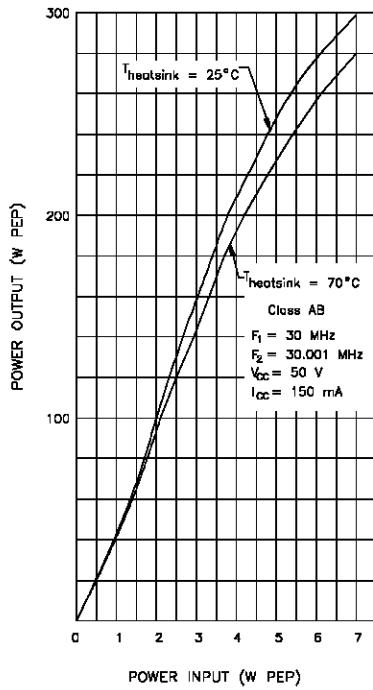
| Symbol | Test Conditions | | | Value | | | Unit |
|---------------------|-------------------------------------|-------------------------------|---------------------------------|-------|------|------|------|
| | | | | Min. | Typ. | Max. | |
| P_{OUT} | $f = 30\text{ MHz}$ | $V_{\text{CC}} = 50\text{ V}$ | $I_{\text{CQ}} = 150\text{ mA}$ | 250 | — | — | W |
| G_{P}^* | $P_{\text{OUT}} = 250\text{ W PEP}$ | $V_{\text{CC}} = 50\text{ V}$ | $I_{\text{CQ}} = 150\text{ mA}$ | 14.5 | — | — | dB |
| IMD^* | $P_{\text{OUT}} = 250\text{ W PEP}$ | $V_{\text{CC}} = 50\text{ V}$ | $I_{\text{CQ}} = 150\text{ mA}$ | — | — | -30 | dBc |
| η_{c}^* | $P_{\text{OUT}} = 250\text{ W PEP}$ | $V_{\text{CC}} = 50\text{ V}$ | $I_{\text{CQ}} = 150\text{ mA}$ | 37 | — | — | % |
| C_{OB} | $f = 1\text{ MHz}$ | $V_{\text{CB}} = 50\text{ V}$ | | — | — | 360 | pF |

Note: * Two Tone Method; $f_1 = 30.00\text{ MHz}$; $f_2 = 30.001\text{ MHz}$
In Class C: G_{P} Min. 13.5 dB, Efficiency 65% @ 30MHz
 G_{P} Min. 10 dB, Efficiency 57% @ 70MHz

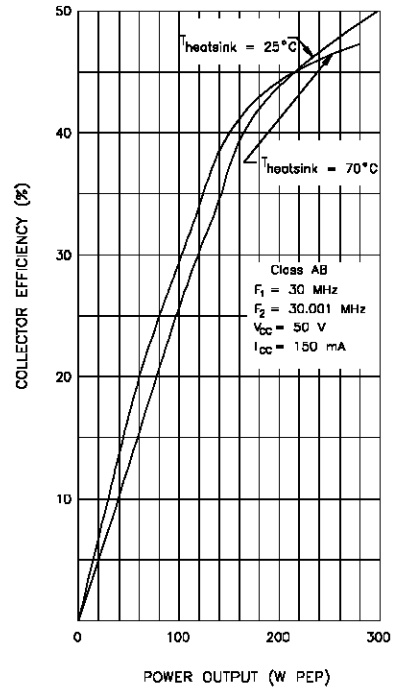
TYPICAL PERFORMANCE

CLASS AB

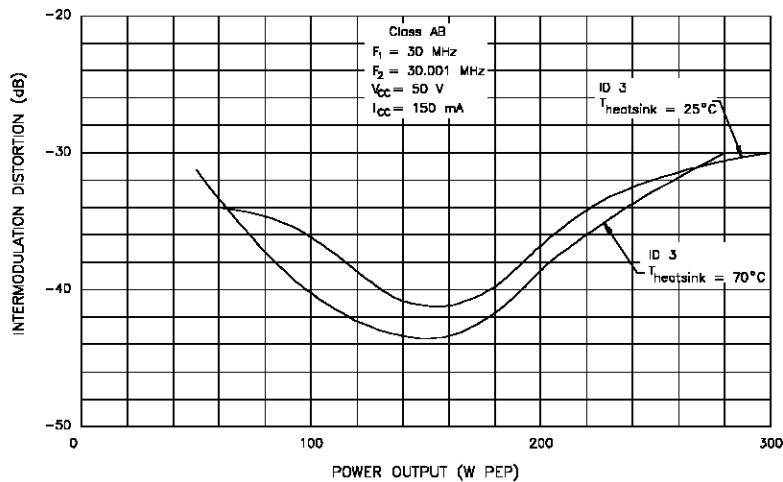
POWER OUTPUT PEP vs POWER INPUT



COLLECTOR EFFICIENCY vs POWER OUTPUT PEP

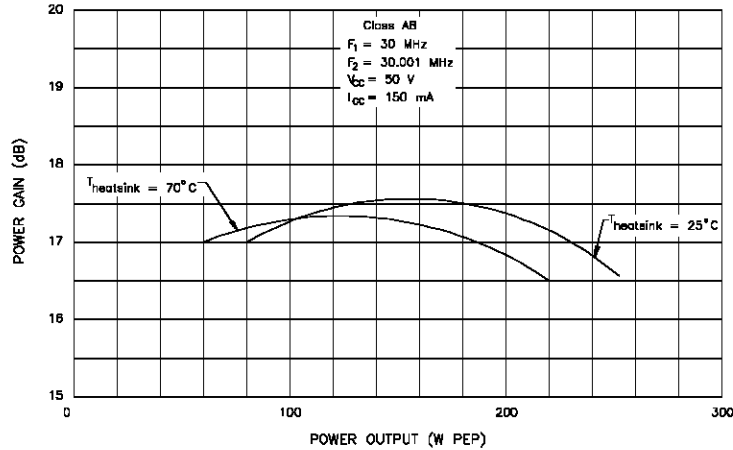


INTERMODULATION DISTORTION vs POWER OUTPUT PEP

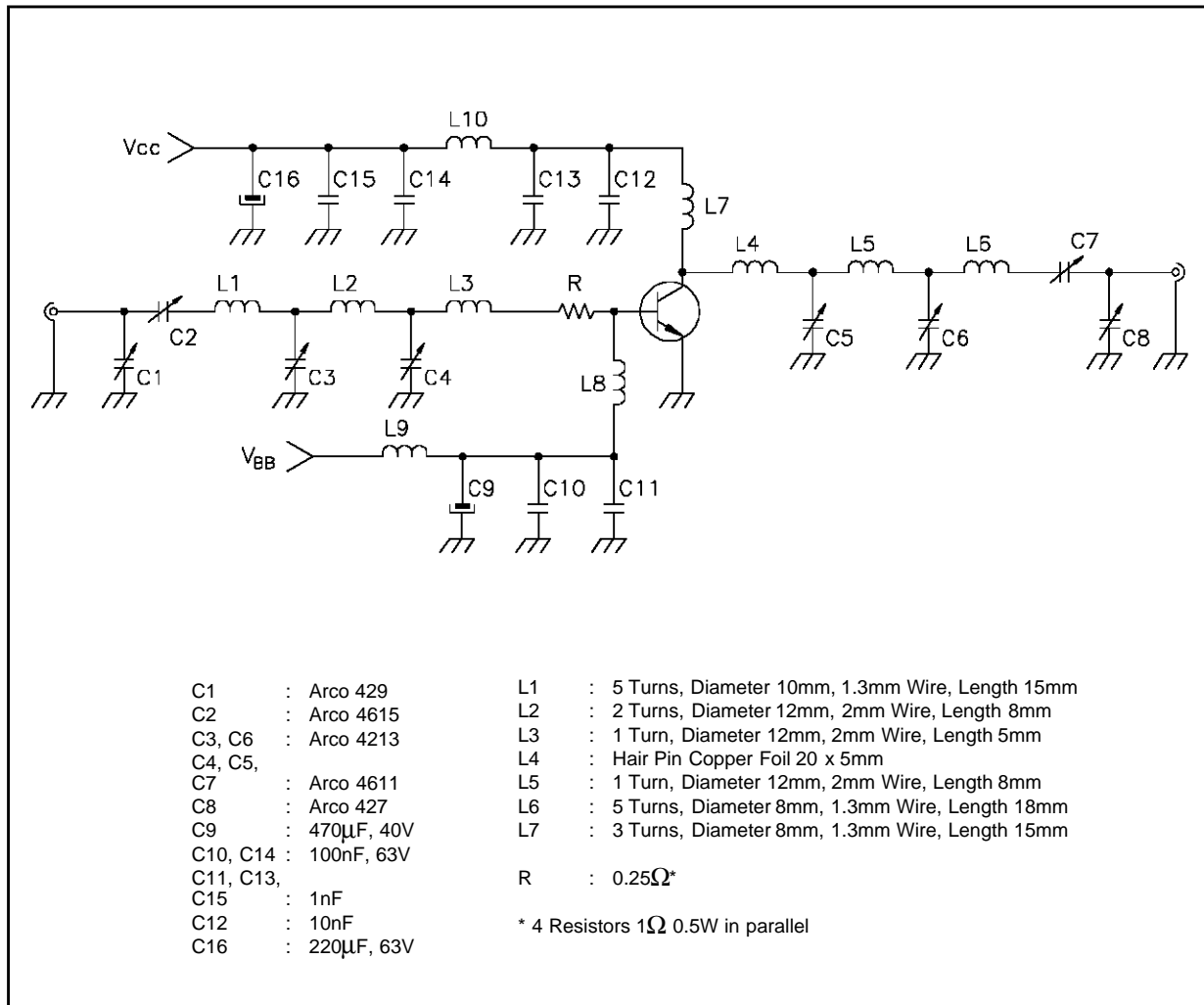


TYPICAL PERFORMANCE (cont'd)

POWER GAIN vs POWER OUTPUT PEP



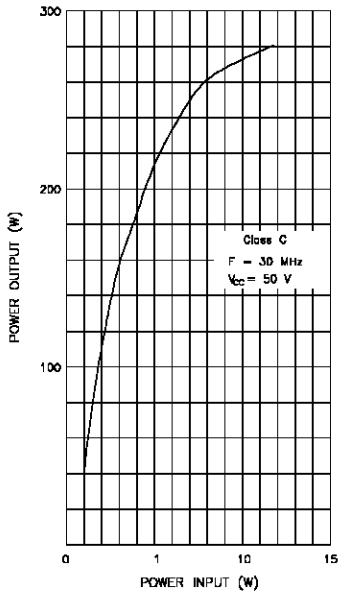
TEST CIRCUIT SSB - CLASS AB - 30 MHz



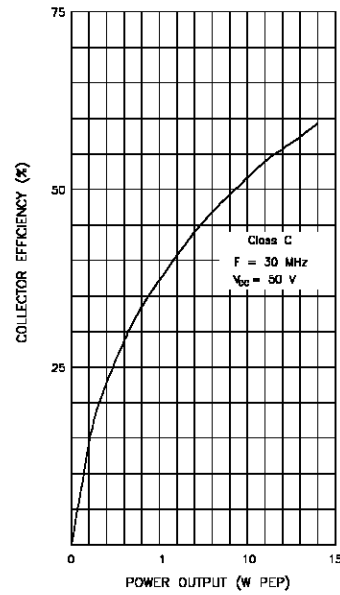
TYPICAL PERFORMANCE

CLASS C F = 30 MHz

POWER OUTPUT vs POWER INPUT

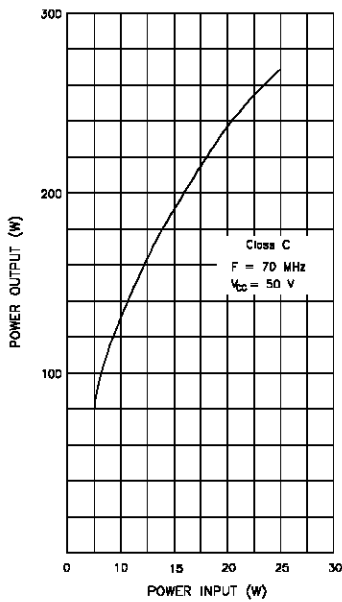


COLLECTOR EFFICIENCY vs POWER OUTPUT

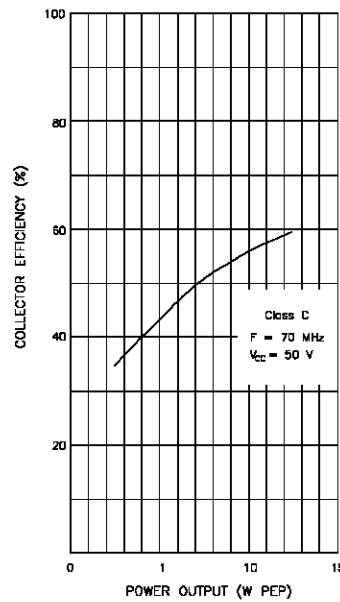


CLASS C F = 70 MHz

POWER OUTPUT vs POWER INPUT



COLLECTOR EFFICIENCY vs POWER OUTPUT

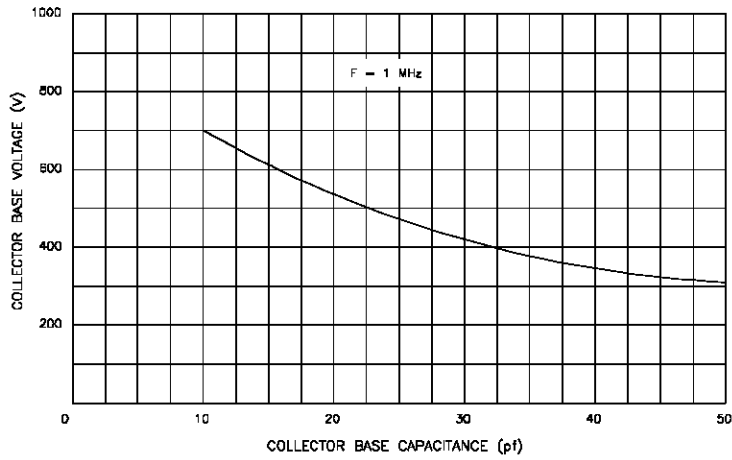


TYPICAL PERFORMANCE (cont'd)

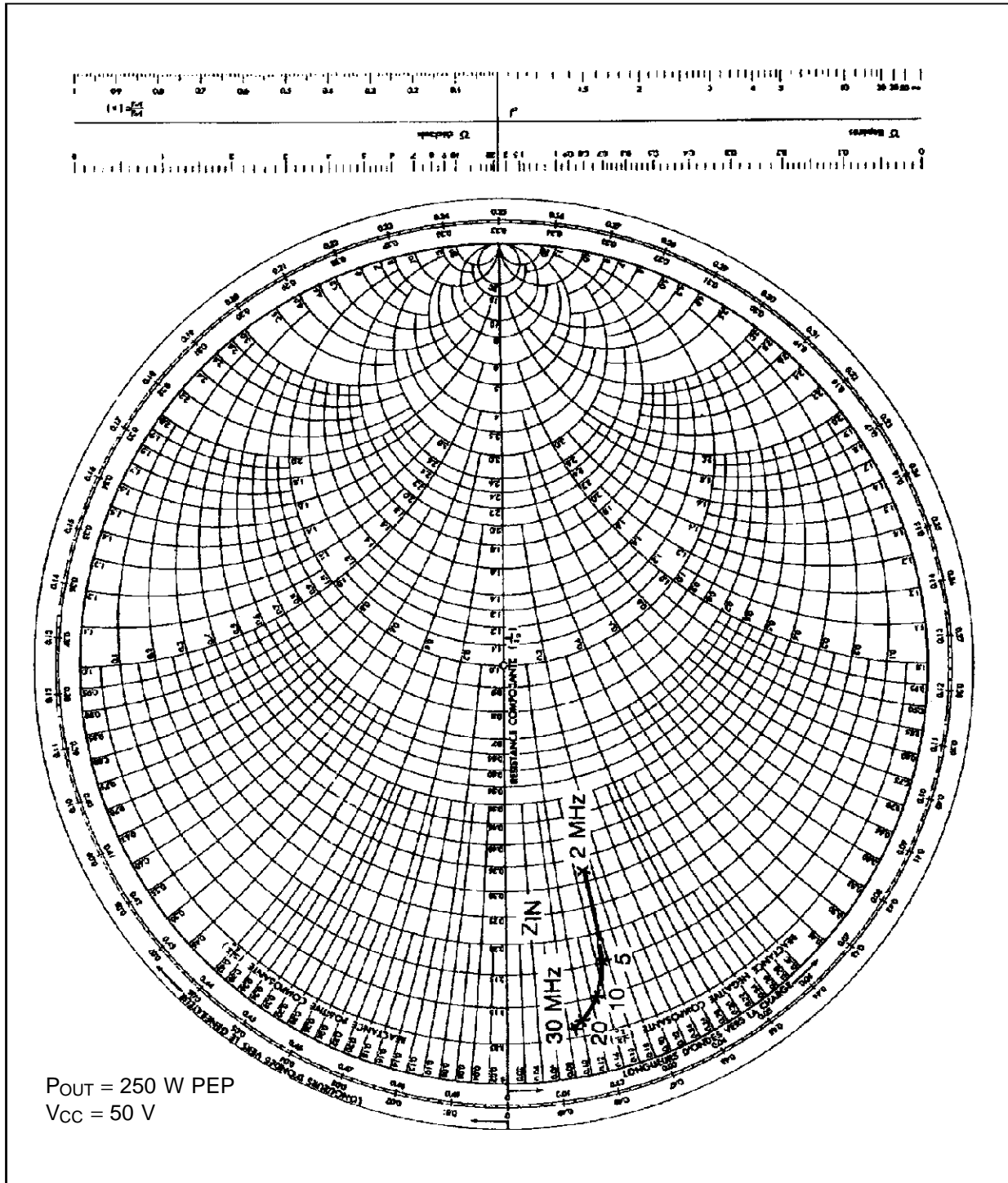
COLLECTOR BASE CAPACITANCE vs COLLECTOR BASE VOLTAGE



DC SAFE OPERATING AREA

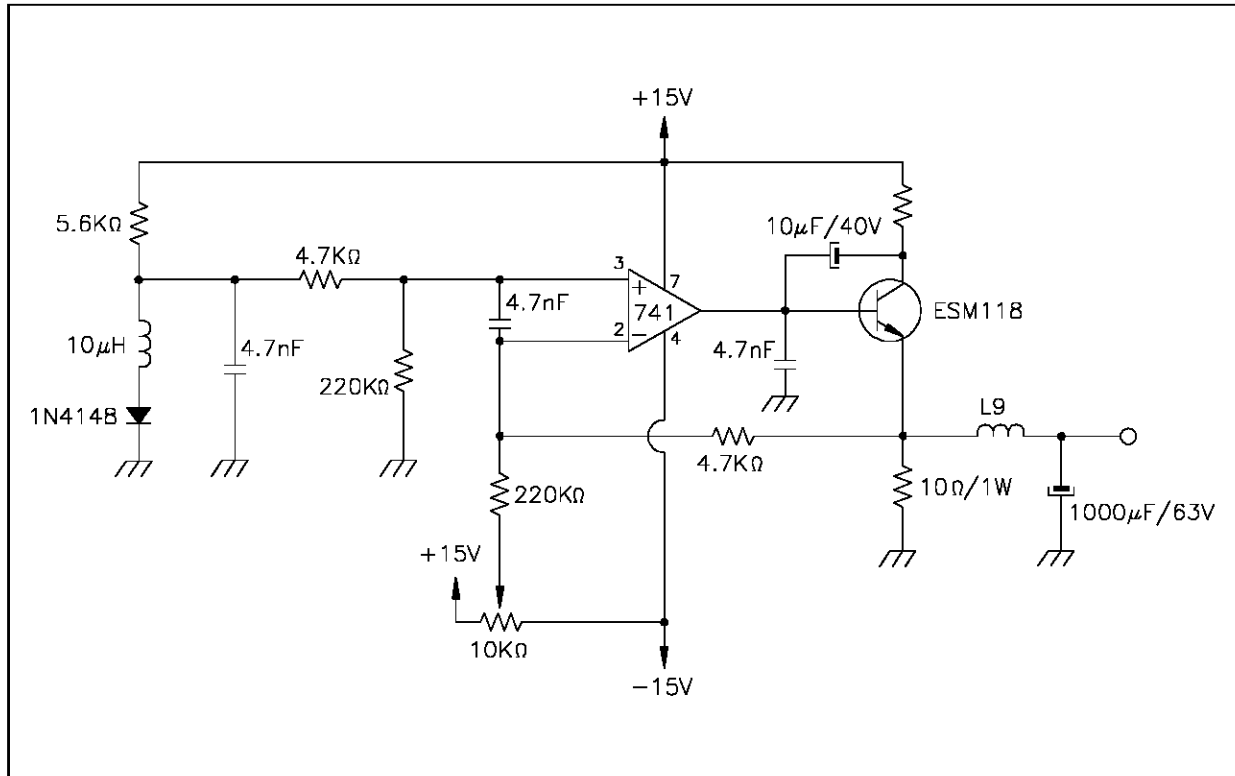


IMPEDANCE DATA (TYPICAL)

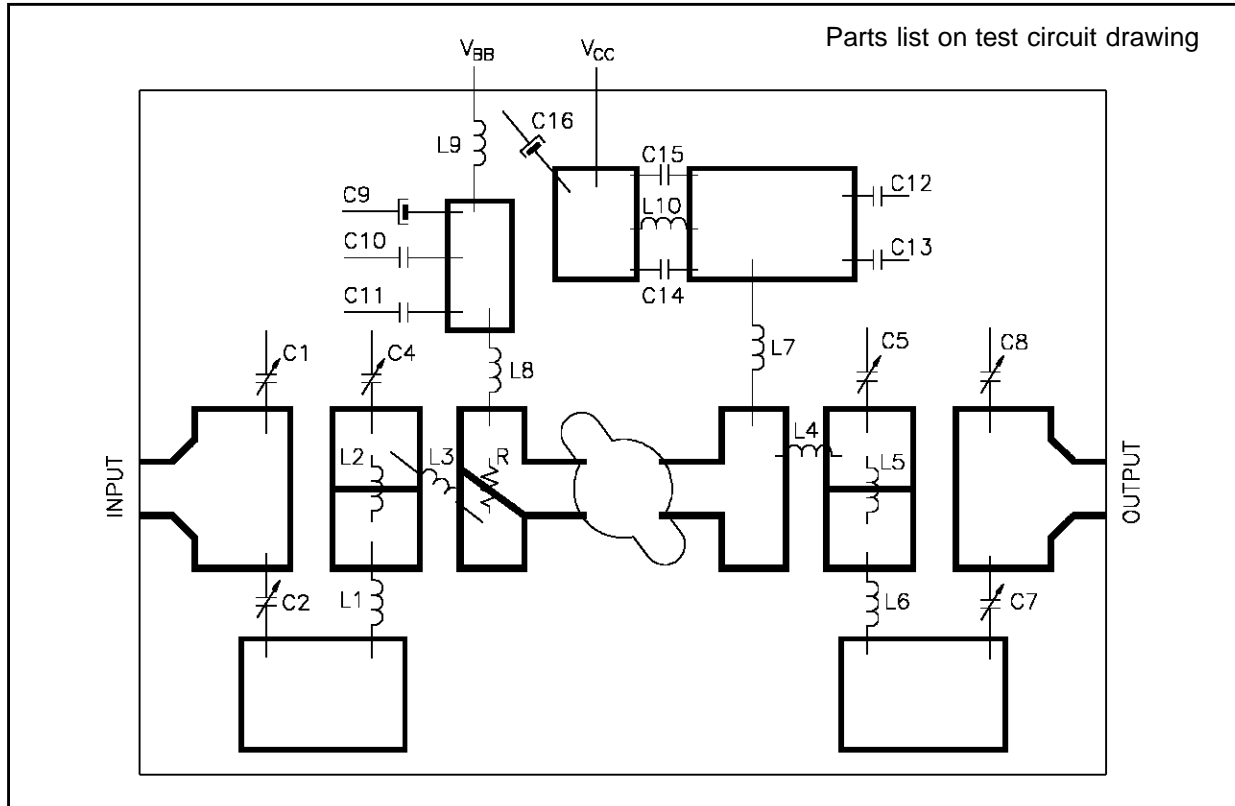


SD1728 (TH430)

BIAS CIRCUIT

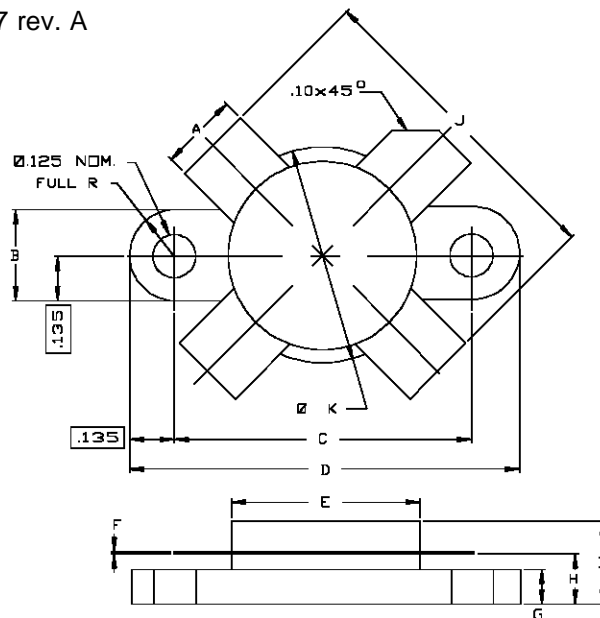


MOUNTING CIRCUIT



PACKAGE MECHANICAL DATA

Ref.: Dwg. No.12-0177 rev. A



| SGS-THOMSON MICROELECTRONICS | | CONT'D | | | |
|------------------------------|----------------------|----------------------|---|----------------------|----------------------|
| | MINIMUM Inches/mm | MAXIMUM Inches/mm | | MINIMUM Inches/mm | MAXIMUM Inches/mm |
| A | .225/5,72 | .235/5,97 | K | .625/15,88 | .635/16,13 |
| B | .265/6,73 | .275/6,96 | | | |
| C | .860/21,84 | .870/22,10 | | | |
| D | 1.130/28,70 | 1.140/28,96 | | | |
| E | .545/13,84 | .555/14,10 | | | |
| F | .003/0,08 | .007/0,18 | | | |
| G | .100/2,54 | .118/3,00 | | | |
| H | .150/3,81 | .170/4,32 | | | |
| I | | .280/7,11 | | | |
| J | 1.080/27,43 | 1.120/28,45 | | | |

Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics 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 SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

©1994 SGS-THOMSON Microelectronics - All Rights Reserved

SGS-THOMSON Microelectronics GROUP OF COMPANIES

Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.