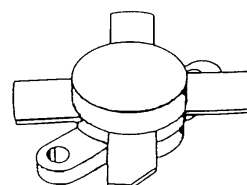


## RF & MICROWAVE TRANSISTORS HF SSB APPLICATIONS

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



**.550 4LFL (M177)**  
epoxy sealed

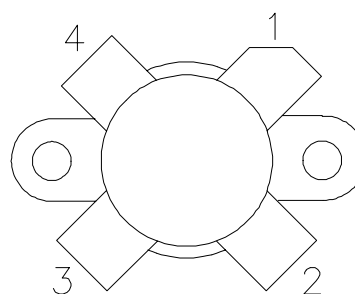
**ORDER CODE**  
SD1728

**BRANDING**  
TH430

### 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.

### PIN CONNECTION



1. Collector	3. Base
2. Emitter	4. Emitter

### ABSOLUTE MAXIMUM RATINGS ( $T_{case} = 25^{\circ}\text{C}$ )

Symbol	Parameter	Value	Unit
$V_{CBO}$	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	$^{\circ}\text{C}$
$T_{STG}$	Storage Temperature	– 65 to +150	$^{\circ}\text{C}$

### THERMAL DATA

$R_{TH(j-c)}$	Junction-Case Thermal Resistance	0.4	$^{\circ}\text{C/W}$
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## SD1728 (TH430)

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

#### STATIC

Symbol	Test Conditions		Value			Unit
			Min.	Typ.	Max.	
$BV_{CES}$	$I_C = 200mA$	$V_{BE} = 0V$	110	—	—	V
$BV_{CEO}$	$I_C = 200mA$	$I_B = 0mA$	55	—	—	V
$BV_{EBO}$	$I_E = 20mA$	$I_C = 0mA$	4.0	—	—	V
$I_{CEO}$	$V_{CE} = 30V$	$I_E = 0mA$	—	—	10	mA
$I_{CES}$	$V_{CE} = 60V$	$I_E = 0mA$	—	—	10	mA
$h_{FE}$	$V_{CE} = 6V$	$I_C = 10A$	15	—	45	—

#### DYNAMIC

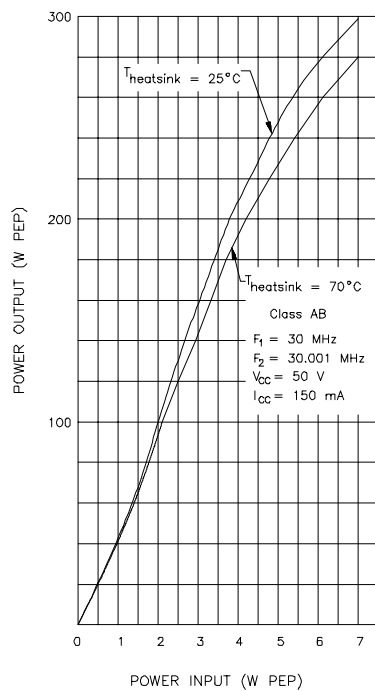
Symbol	Test Conditions			Value			Unit
				Min.	Typ.	Max.	
$P_{OUT}$	$f = 30\text{ MHz}$	$V_{CC} = 50\text{ V}$	$I_{CQ} = 150\text{ mA}$	250	—	—	W
$G_P^*$	$P_{OUT} = 250\text{ W PEP}$	$V_{CC} = 50\text{ V}$	$I_{CQ} = 150\text{ mA}$	14.5	—	—	dB
IMD*	$P_{OUT} = 250\text{ W PEP}$	$V_{CC} = 50\text{ V}$	$I_{CQ}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

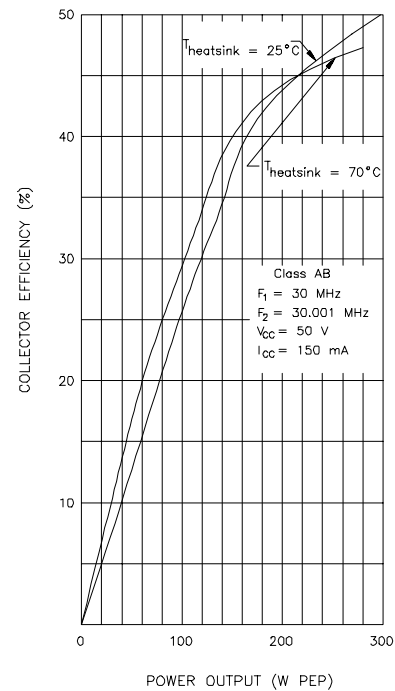
## TYPICAL PERFORMANCE

## CLASS AB

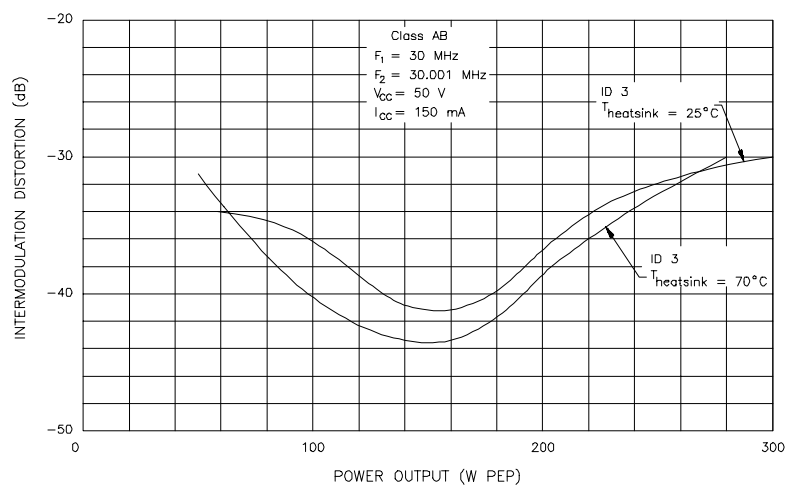
POWER OUTPUT PEP vs POWER INPUT



COLLECTOR EFFICIENCY vs POWER OUTPUT PEP

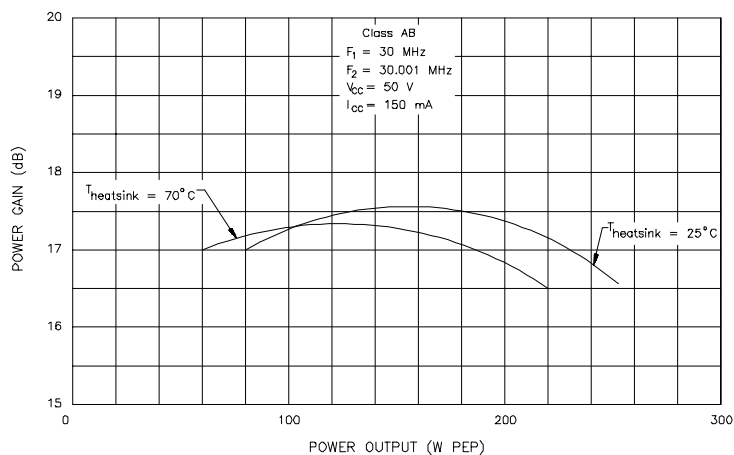


INTERMODULATION DISTORTION vs POWER OUTPUT PEP

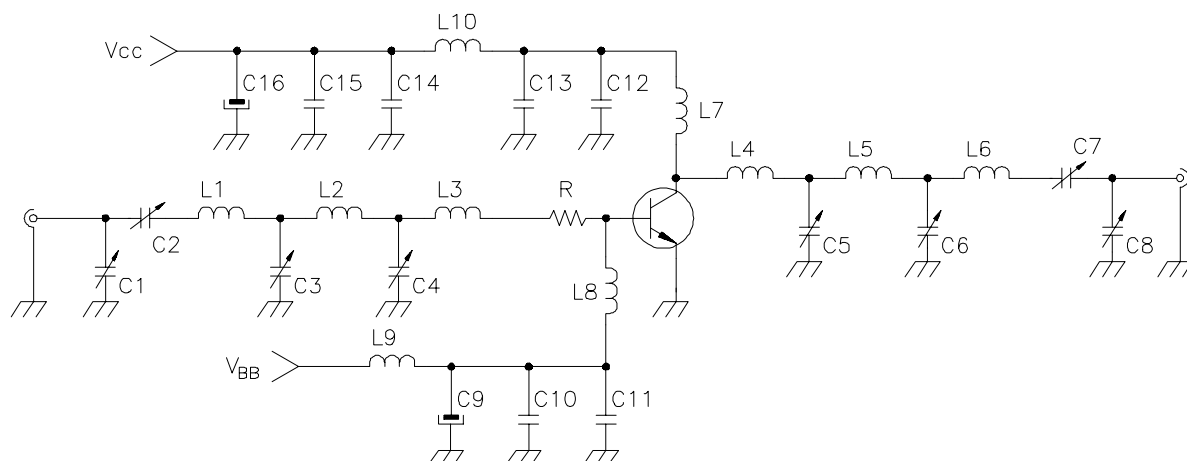


## TYPICAL PERFORMANCE (cont'd)

POWER GAIN vs POWER OUTPUT PEP



## TEST CIRCUIT SSB - CLASS AB - 30 MHz



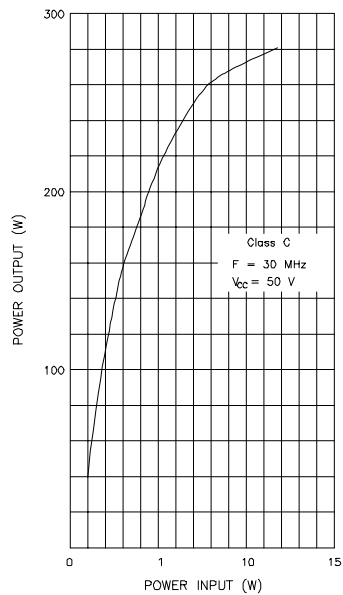
C1	: Arco 429	L1	: 5 Turns, Diameter 10mm, 1.3mm Wire, Length 15mm
C2	: Arco 4615	L2	: 2 Turns, Diameter 12mm, 2mm Wire, Length 8mm
C3, C6	: Arco 4213	L3	: 1 Turn, Diameter 12mm, 2mm Wire, Length 5mm
C4, C5,		L4	: Hair Pin Copper Foil 20 x 5mm
C7	: Arco 4611	L5	: 1 Turn, Diameter 12mm, 2mm Wire, Length 8mm
C8	: Arco 427	L6	: 5 Turns, Diameter 8mm, 1.3mm Wire, Length 18mm
C9	: 470 $\mu$ F, 40V	L7	: 3 Turns, Diameter 8mm, 1.3mm Wire, Length 15mm
C10, C14	: 100nF, 63V		
C11, C13,		R	: 0.25 $\Omega$ *
C15	: 1nF		
C12	: 10nF		
C16	: 220 $\mu$ F, 63V		

\* 4 Resistors 1 $\Omega$  0.5W in parallel

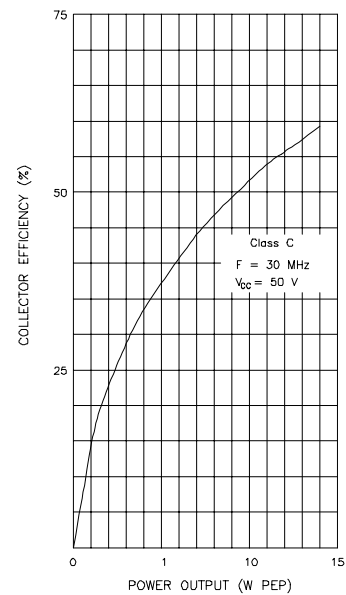
## TYPICAL PERFORMANCE

CLASS C  $F = 30 \text{ MHz}$ 

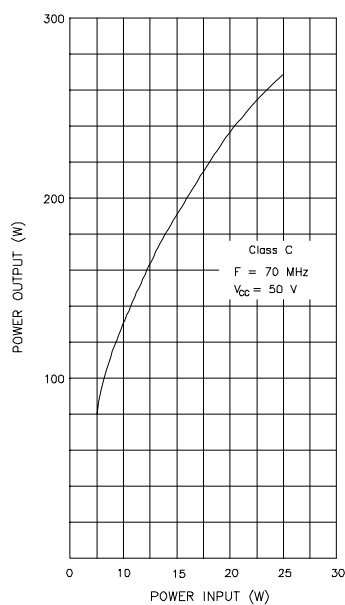
POWER OUTPUT vs POWER INPUT



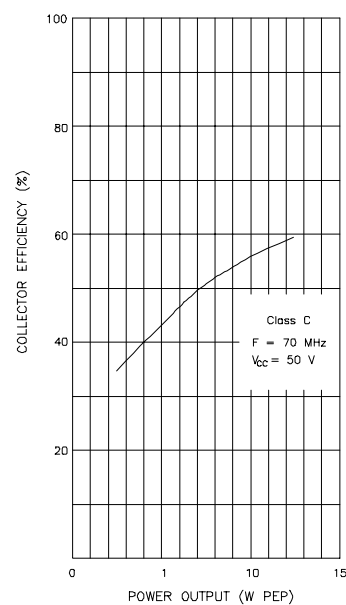
COLLECTOR EFFICIENCY vs POWER OUTPUT

CLASS C  $F = 70 \text{ MHz}$ 

POWER OUTPUT vs POWER INPUT

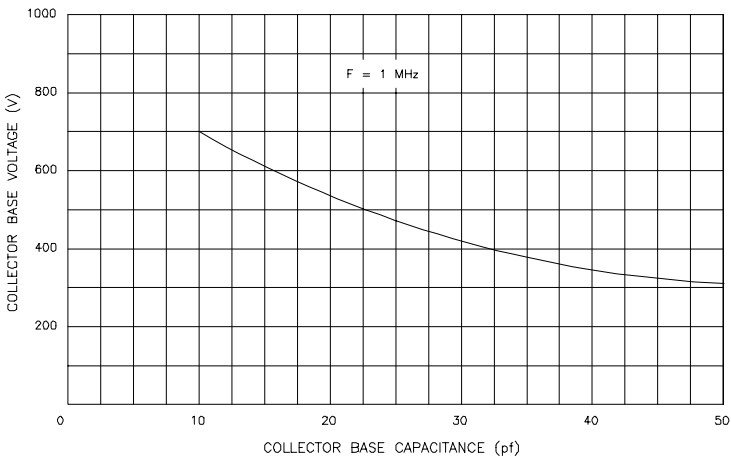


COLLECTOR EFFICIENCY vs POWER OUTPUT

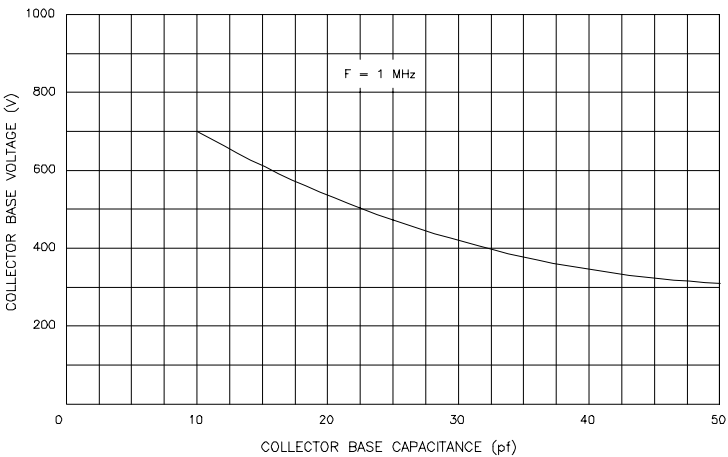


TYPICAL PERFORMANCE (cont'd)

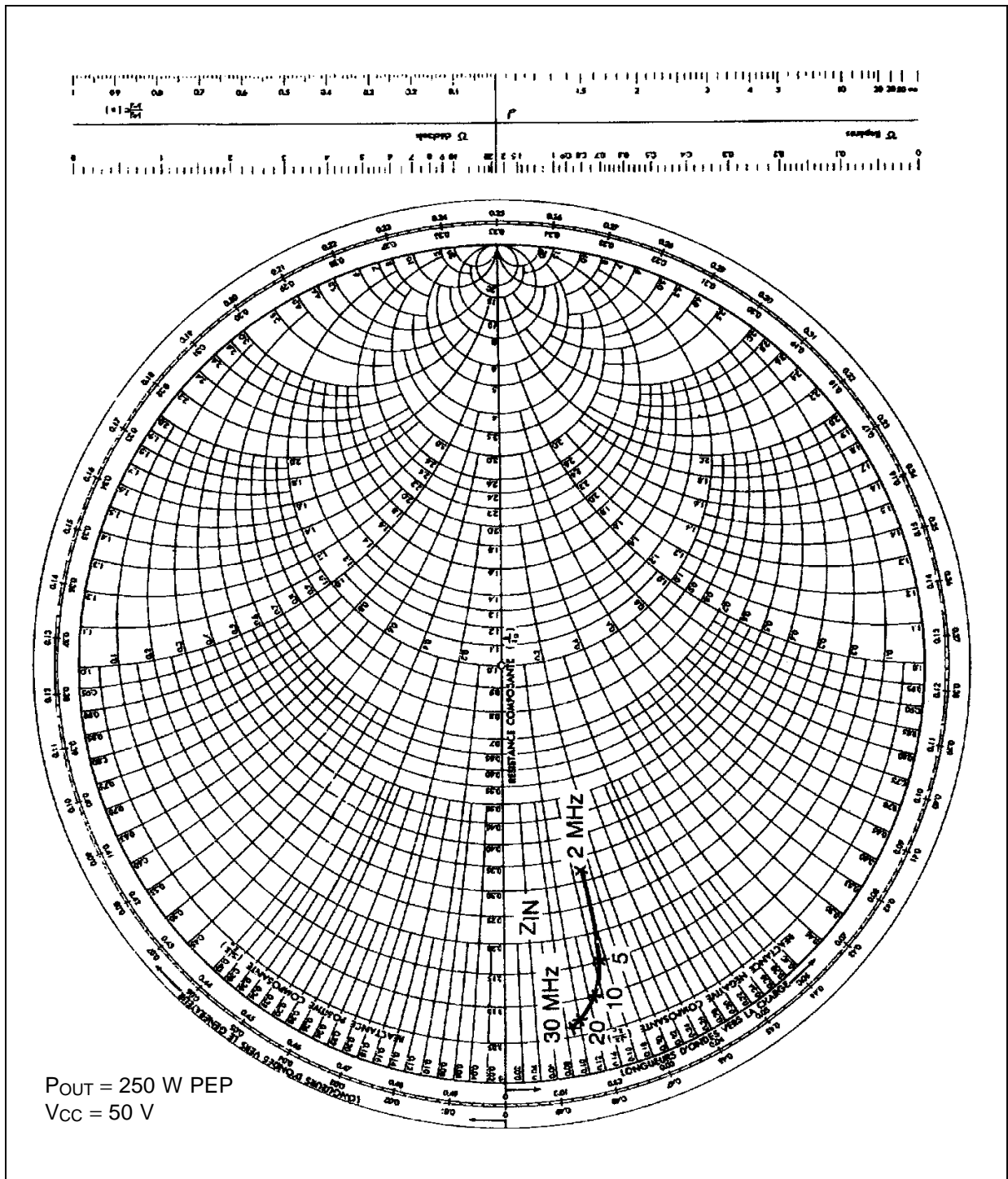
COLLECTOR BASE CAPACITANCE vs COLLECTOR BASE VOLTAGE



DC SAFE OPERATING AREA

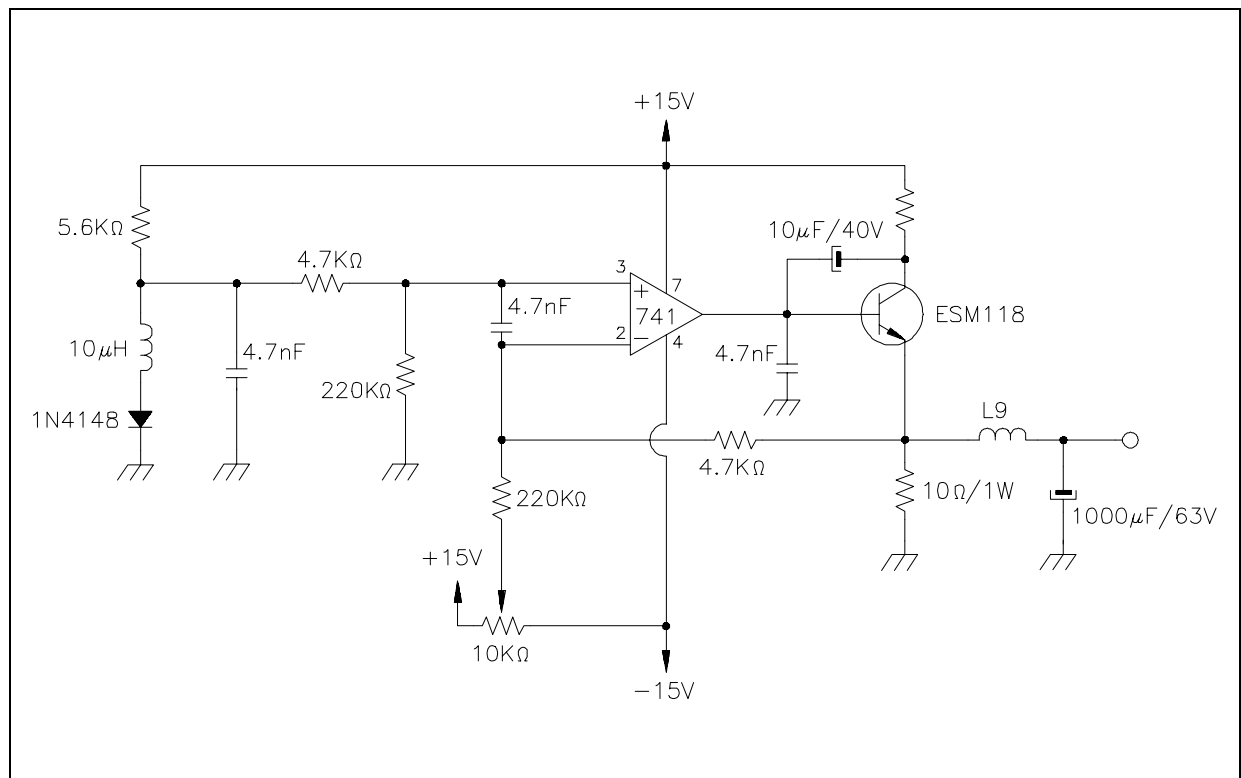


## IMPEDANCE DATA (TYPICAL)

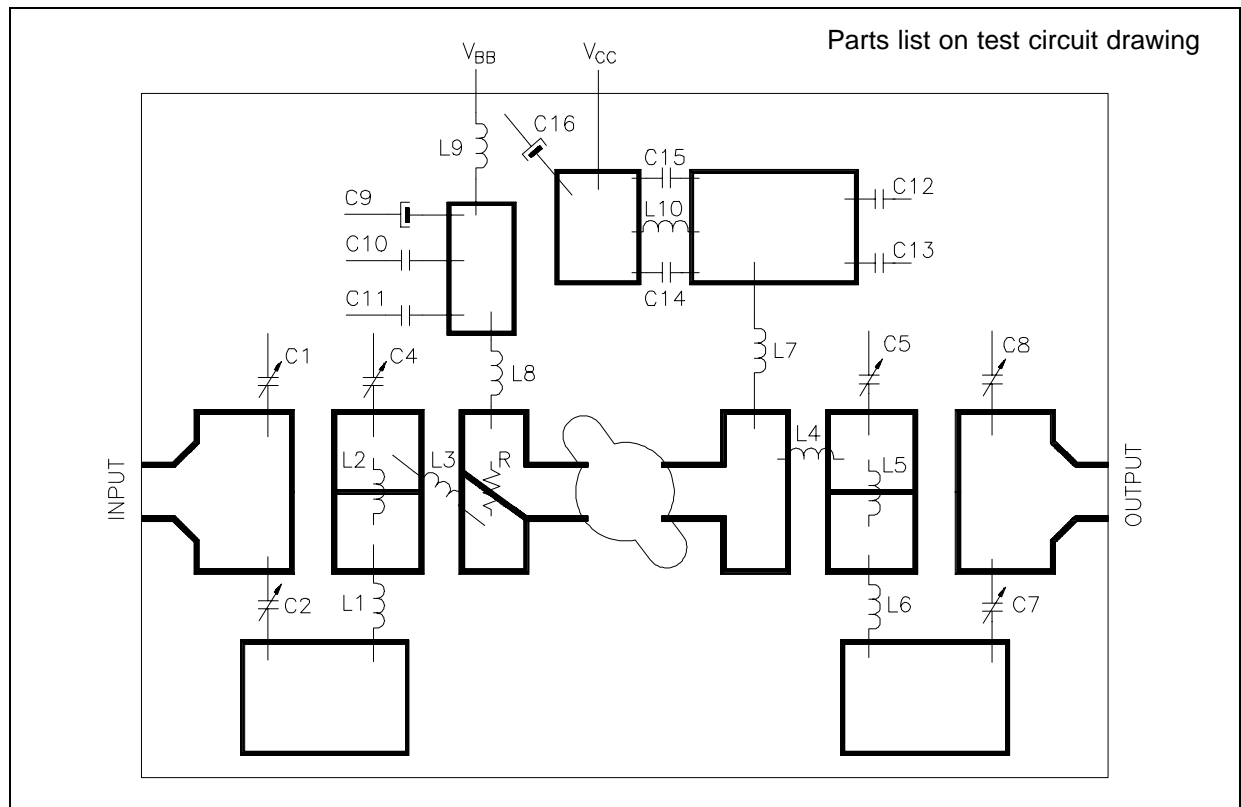


## SD1728 (TH430)

### BIAS CIRCUIT



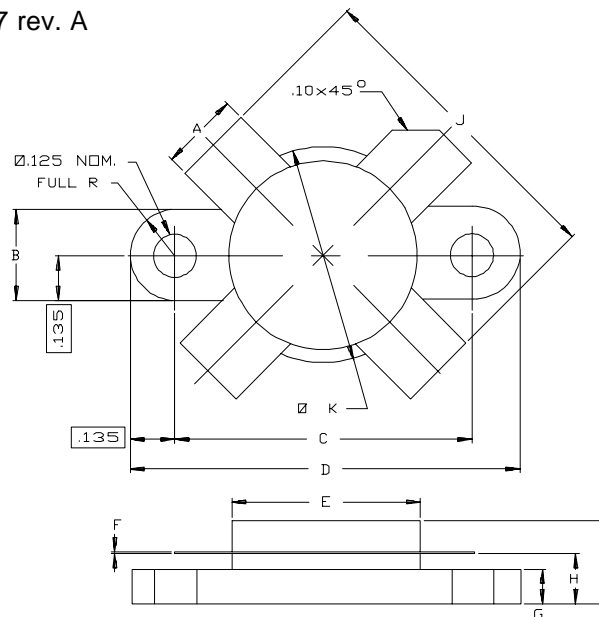
### MOUNTING CIRCUIT





## 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			

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