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CM5943

NPN SILICON
HIGH FREQUENCY TRANSISTOR

JEDEC TO-39 CASE

DESCRIPTION

The CENTRAL SEMICONDUCTOR CM5943 is a Silicon NPN RF Transistor, mounted in a hermetically sealed package, designed for high frequency amplifier and non-saturated switching applications. This device is a replacement for the 2N5943.

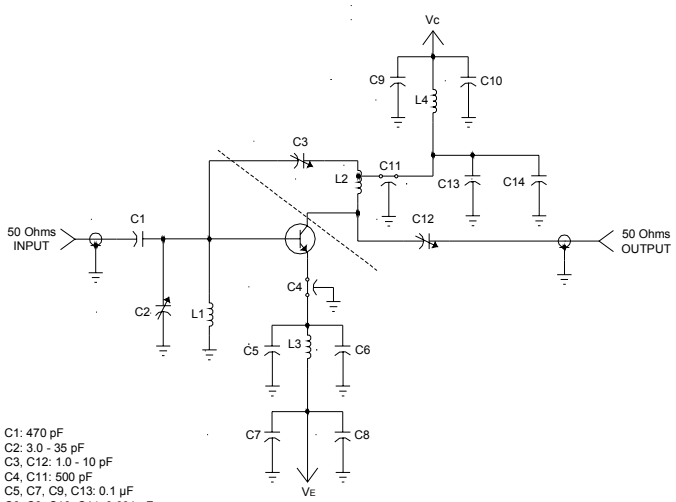
MAXIMUM RATINGS (T_A=25°C unless otherwise noted)

	SYMBOL		UNITS
Collector-Base Voltage	V_{CBO}	40	V
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Base Voltage	V_{EBO}	3.5	V
Collector Current	I_C	400	mA
Power Dissipation	P_D	1.0	W
Power Dissipation (T_C=25°C)	P_D	3.5	W
Operating and Storage Junction Temperature	T_J,T_{stg}	-65 to +200	°C
Thermal Resistance	Θ_{JA}	175	°C/W
Thermal Resistance	Θ_{JC}	50	°C/W

ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

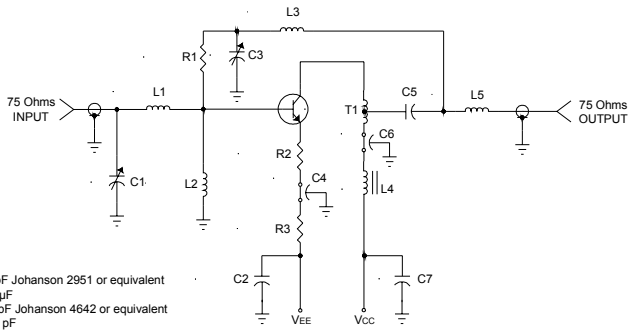
SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
I_{CBO}	V_{CB}=15V			10	μA
I_{CEO}	V_{CE}=20V			50	μA
BV_{CBO}	I_C=100μA	40			V
BV_{CEO}	I_C=5.0mA	30			V
BV_{EBO}	I_E=100μA	3.5			V
$V_{CE(SAT)}$	I_C=100mA, I_B=10mA			0.2	V
$V_{BE(SAT)}$	I_C=100mA, I_B=10mA			1.0	V
h_{FE}	V_{CE}=15V, I_C=50mA	25		300	
f_T	V_{CE}=15V, I_C=25mA, f=200MHz	1000			MHz
f_T	V_{CE}=15V, I_C=50mA, f=200MHz	1200		2400	MHz
f_T	V_{CE}=15V, I_C=100mA, f=200MHz	1000			MHz
C_{cb}	V_{CB}=30V, I_E=0, f=100kHz	1.0		2.5	pF
C_{eb}	V_{EB}=0.5V, I_C=0, f=100kHz			15	pF
h_{fe}	V_{CE}=15V, I_C=50mA, f=1.0kHz	25		350	
rb'C_c	V_{CB}=15V, I_E=50mA, f=31.8MHz	2.0		20	ps
NF	V_{CE}=15V, I_C=30mA, f=200MHz (Figure 1)		3.4		dB
NF	V_{CE}=15V, I_C=35mA, f=200MHz (Figure 2)			8.0	dB
G_{pe}	V_{CE}=15V, I_C=10mA, f=200MHz (Figure 1)		11.4		dB
G_{pe}	V_{CE}=15V, I_C=50mA, f=250MHz (Figure 2)	7.0			dB

(SEE REVERSE SIDE)



C1: 470 pF
C2: 3.0 - 35 pF
C3, C12: 1.0 - 10 pF
C4, C11: 500 pF
C5, C7, C9, C13: 0.1 µF
C6, C8, C10, C14: 0.001 µF
L1: 2 turns #20 wire, 1/4" ID, 3/16" long
L2: 5 turns #18 wire, 1/4" ID, 5/8" long, tapped 1-3/4 turns from collector
L3, L4: 0.47 µH

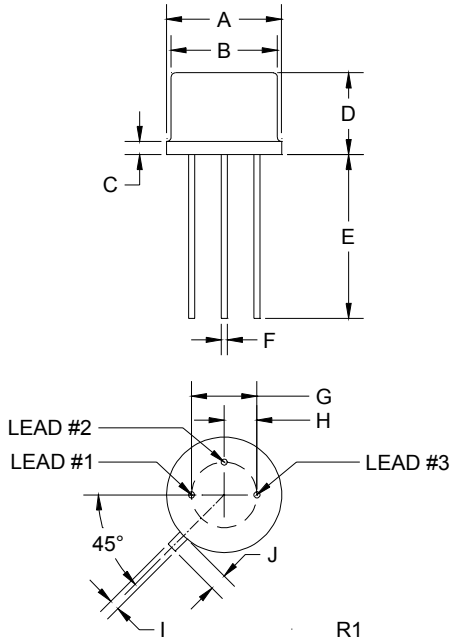
Figure 1.
Narrow-Band Test Circuit



C1: 1.0 - 10 pF Johanson 2951 or equivalent
C2, C7: 0.01 µF
C3: 0.5 - 6.0 pF Johanson 4642 or equivalent
C4, C6: 1500 pF
C5: 470 pF
L1: 2 turns AWG #26, 5/32" ID
L2: 1µH molded choke
L3: 5 turns AWG #26, 3/32" ID
L4: ferrite, 3 turns #30 on stackpole 57-0156 bead
L5: 2 turns AWG #26, 3/32" ID
T1: AWG #30 trifilar wound 1-9-9 on stackpole 57-0985, #11 toroid
R1: 270 ohms
R2: 18 ohms
R3: 150 ohms

Figure 2.
Broad-Band Test Circuit

TO-39 PACKAGE - MECHANICAL OUTLINE



DIMENSIONS				
	INCHES		MILLIMETERS	
SYMBOL	MIN	MAX	MIN	MAX
A (DIA)	0.335	0.370	8.51	9.40
B (DIA)	0.315	0.335	8.00	8.51
C	-	0.040	-	1.02
D	0.240	0.260	6.10	6.60
E	0.500	-	12.70	-
F (DIA)	0.016	0.021	0.41	0.53
G (DIA)	0.200		5.08	
H	0.100		2.54	
I	0.028	0.034	0.71	0.86
J	0.029	0.045	0.74	1.14

TO-39 (REV: R1)

LEAD CODE:
1) Emitter
2) Base
3) Collector

R0 (1- October 2001)

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