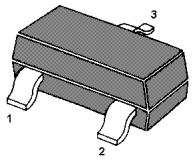
MMBTSC3928

NPN Silicon Epitaxial Planar Transistor

for low frequency amplification applications

The transistor is subdivided into four groups Q, R, S and T, according to its DC current gain.



1. Base 2. Emitter 3. Collector

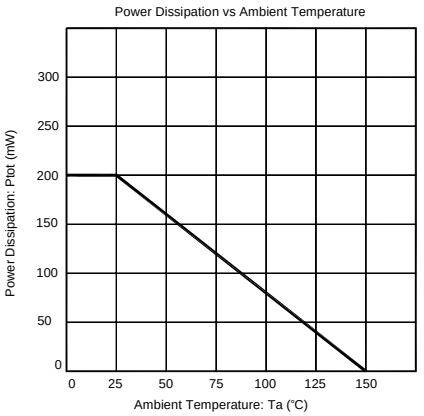
SOT-23 Plastic Package

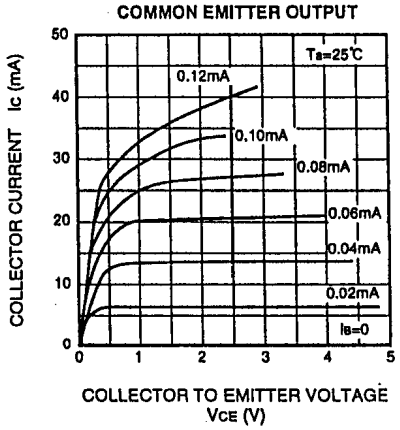
Absolute Maximum Ratings (T_a = 25 °C)

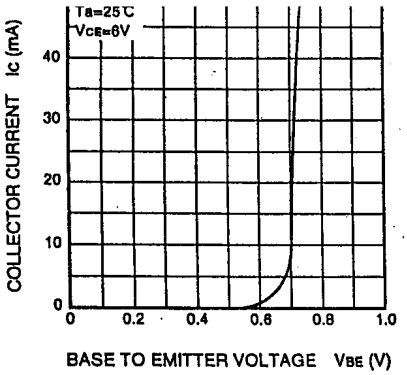
Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	50	V
Collector Emitter Voltage	V_{CEO}	50	V
Emitter Base Voltage	V_{EBO}	6	V
Collector Current	I_C	200	mA
Power Dissipation	P_{tot}	200	mW
Junction Temperature	T_j	150	°C
Storage Temperature Range	T_{stg}	- 55 to + 150	°C

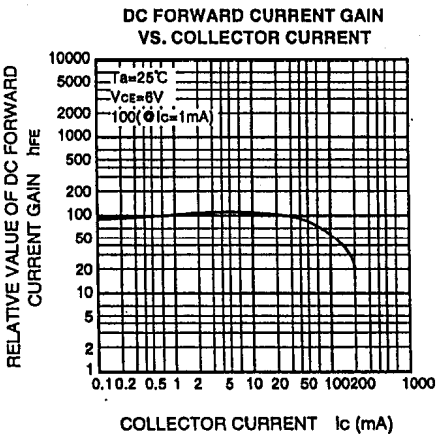
Characteristics at T_a = 25 °C

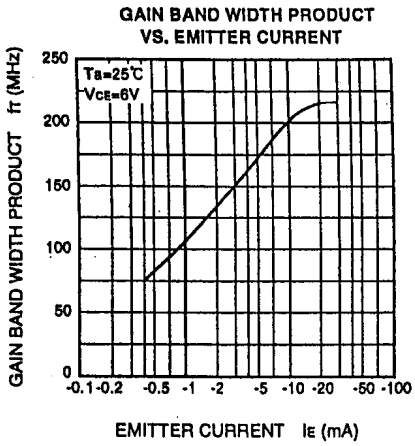
Parameter			Symbol	Min.	Typ.	Max.	Unit
DC Current Gain							
at V_{CE} = 6 V, I_C = 1 mA	Current Gain Group	Q	h_{FE}	120	-	270	-
		R	h_{FE}	180	-	390	-
		S	h_{FE}	270	-	560	-
		T	h_{FE}	390	-	820	-
at V_{CE} = 6 V, I_C = 0.1 mA			h_{FE}	70	-	-	-
Collector Base Cutoff Current at V_{CB} = 50 V			I_{CBO}	-	-	100	nA
Emitter Base Cutoff Current at V_{EB} = 4 V			I_{EBO}	-	-	100	nA
Collector Base Breakdown Voltage at I_C = 100 µA			$V_{(BR)CBO}$	50	-	-	V
Collector Emitter Breakdown Voltage at I_C = 100 µA			$V_{(BR)CEO}$	50	-	-	V
Emitter Base Breakdown Voltage at I_C = 100 µA			$V_{(BR)EBO}$	6	-	-	V
Collector Emitter Saturation Voltage at I_C = 100 mA, I_B = 10 mA			$V_{CE(sat)}$	-	-	0.3	V
Gain Bandwidth Product at V_{CE} = 6 V, $-I_E$ = 10 mA			f_T	-	200	-	MHz
Collector Output Capacitance at V_{CB} = 6 V, f = 1 MHz			C_{ob}	-	4	-	pF

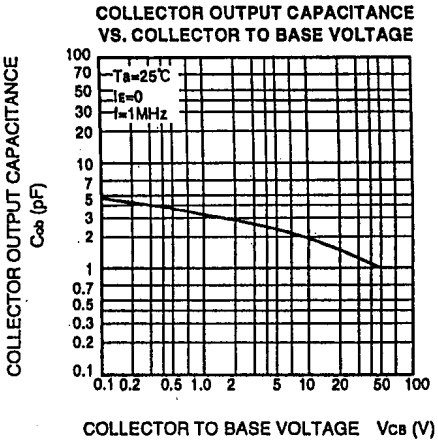

Power Dissipation vs Ambient Temperature
Power Dissipation: Ptot (mW)
300
250
200
150
100
50
0
0 25 50 75 100 125 150
Ambient Temperature: Ta (°C)


COMMON EMITTER OUTPUT
COLLECTOR CURRENT Ic (mA)
Ta=25℃
0.12mA
0.10mA
0.08mA
0.06mA
0.04mA
0.02mA
IB=0
50
40
30
20
10
0
0 1 2 3 4 5
COLLECTOR TO EMITTER VOLTAGE
VCE (V)


Ta=25℃
VCE=6V
COLLECTOR CURRENT Ic (mA)
40
30
20
10
0
0 0.2 0.4 0.6 0.8 1.0
BASE TO EMITTER VOLTAGE VBE (V)


DC FORWARD CURRENT GAIN
VS. COLLECTOR CURRENT
RELATIVE VALUE OF DC FORWARD CURRENT GAIN hFE
Ta=25℃
VCE=6V
100(@Ic=1mA)
10000
5000
2000
1000
500
200
100
50
20
10
5
2
1
0.1 0.2 0.5 1 2 5 10 20 50 100 200 1000
COLLECTOR CURRENT Ic (mA)


GAIN BAND WIDTH PRODUCT
VS. EMITTER CURRENT
GAIN BAND WIDTH PRODUCT fT (MHz)
Ta=25℃
VCE=6V
250
200
150
100
50
0
-0.1 -0.2 -0.5 -1 -2 -5 -10 -20 -50 -100
EMITTER CURRENT IE (mA)


COLLECTOR OUTPUT CAPACITANCE
VS. COLLECTOR TO BASE VOLTAGE
COLLECTOR OUTPUT CAPACITANCE Cob (pF)
Ta=25℃
IE=0
f=1MHz
100
70
50
30
20
10
7
5
3
2
1
0.7
0.5
0.3
0.2
0.1
0.1 0.2 0.5 1.0 2 5 10 20 50 100
COLLECTOR TO BASE VOLTAGE VCB (V)