

### SOT-23



#### Pin Definition:

1. Base
2. Emitter
3. Collector

### PRODUCT SUMMARY

$BV_{CBO}$	80V
$BV_{CEO}$	60V
$I_C$	3A
$V_{CE(SAT)}$	0.60V @ $I_C / I_B = 3 / 300mA$

### Features

- High Collector-Emitter  $BV_{CEO}=60V$
- High Collector Current  $I_C = 3A$

### Structure

- Epitaxial Planar Type
- NPN Silicon Transistor

### Ordering Information

Part No.	Package	Packing
TSC5904CX RF	SOT-23	3Kpcs / 7" Reel

### Absolute Maximum Rating ( $T_a = 25^\circ C$ unless otherwise noted)

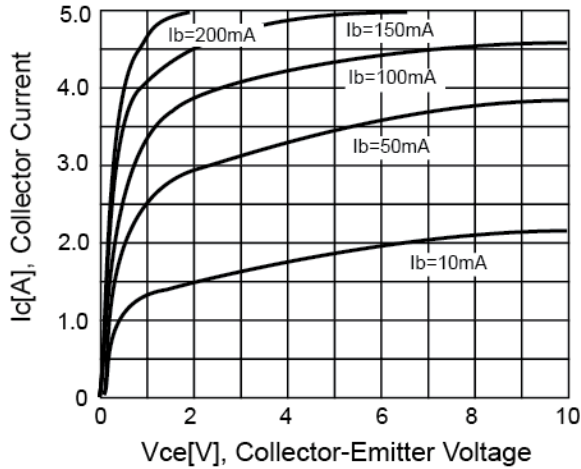
Parameter	Symbol	Limit	Unit
Collector-Base Voltage	$V_{CBO}$	80	V
Collector-Emitter Voltage	$V_{CEO}$	60	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Collector Current	$I_C$	3	A
Total Power Dissipation	$P_{tot}$	500	mW
Operating Junction Temperature	$T_J$	+150	$^\circ C$
Operating Junction and Storage Temperature Range	$T_{STG}$	- 55 to +150	$^\circ C$

### Electrical Specifications ( $T_a = 25^\circ C$ unless otherwise noted)

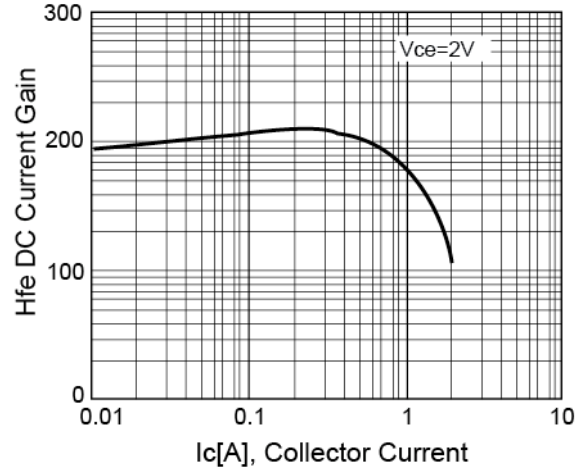
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage	$I_C = 10\mu A, I_E = 0$	$BV_{CBO}$	80	--	--	V
Collector-Emitter Breakdown Voltage	$I_C = 1mA, I_B = 0$	$BV_{CEO}$	60	--	--	V
Emitter-Base Breakdown Voltage	$I_E = 10\mu A, I_C = 0$	$BV_{EBO}$	5	--	--	V
Collector Cutoff Current	$V_{CB} = 40V, I_E = 0$	$I_{CBO}$	--	--	0.1	$\mu A$
Emitter Cutoff Current	$V_{EB} = 4V, I_C = 0$	$I_{EBO}$	--	--	0.1	$\mu A$
Collector-Emitter Saturation Voltage	$I_C = 1A, I_B = 100mA$	$V_{CE(SAT) 1}$	--	0.12	0.3	V
	$I_C = 3A, I_B = 300mA$	$V_{CE(SAT) 2}$	--	0.43	0.6	
Base-Emitter Saturation Voltage	$I_C = 1A, I_B = 100mA$	$V_{BE(SAT)}$	--	0.9	1.25	V
Base-Emitter on Voltage	$V_{CE} = 2V, I_C = 1A$	$V_{BE(ON)}$	--	0.8	1.0	V
DC Current Transfer Ratio	$V_{CE} = 2V, I_C = 50mA$	$h_{FE 1}$	70	--	--	
	$V_{CE} = 2V, I_C = 1A$	$h_{FE 2}$	100	--	300	
	$V_{CE} = 2V, I_C = 3A$	$h_{FE 3}$	80	--	--	
	$V_{CE} = 2V, I_C = 500mA$	$h_{FE 4}$	40	--	--	
Transition Frequency	$V_{CE} = 5V, I_C = 100mA$	$f_T$	140		--	MHz
Output Capacitance	$V_{CB} = 10V, f = 1MHz$	$C_{ob}$	--	--	30	pF
Switching Times	$V_{CC} = 10V, I_C = 500mA, I_{B1} = -I_{B2} = 50mA$	$T_{on}$	--	45	--	nS
		$T_{off}$	--	800	--	nS

**Electrical Characteristics Curve** (Ta = 25°C, unless otherwise noted)

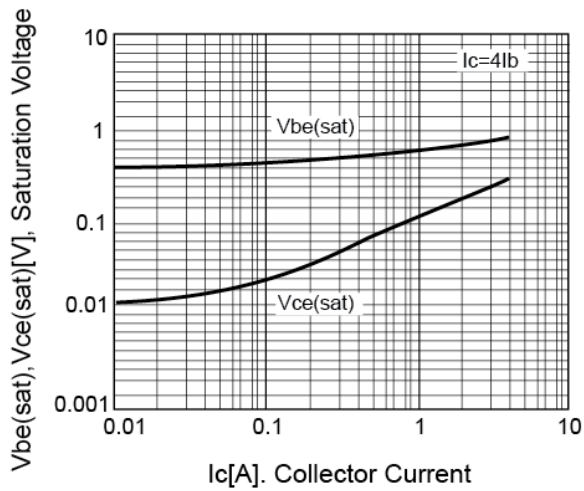
**Figure 1. Static Characteristics**



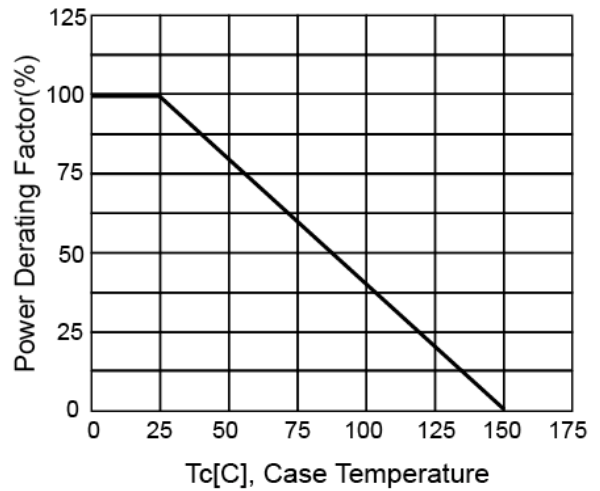
**Figure 2. DC Current Gain**



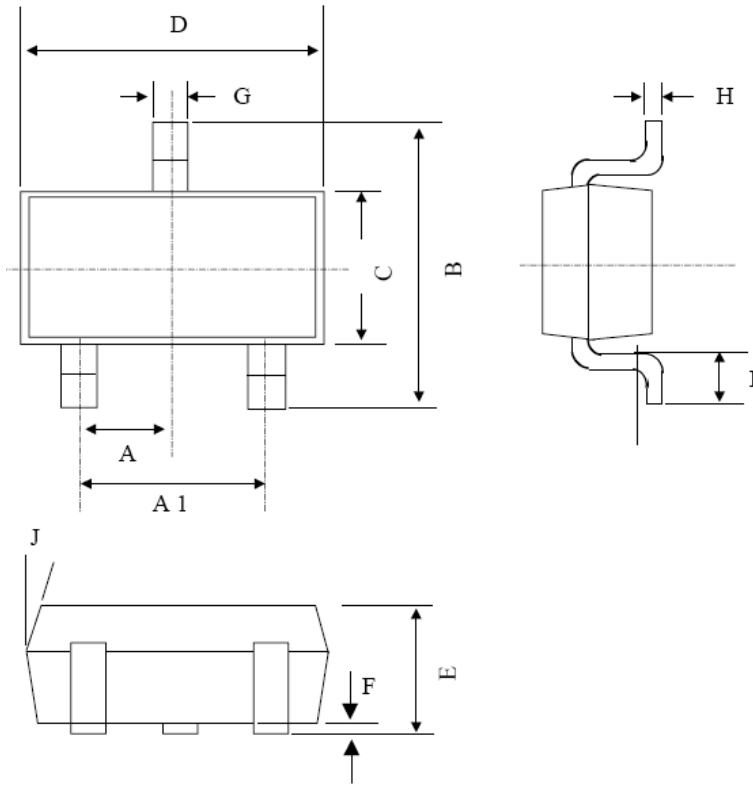
**Figure 3. VCE(SAT) v.s. VBE(SAT)**



**Figure 4. Power Derating**

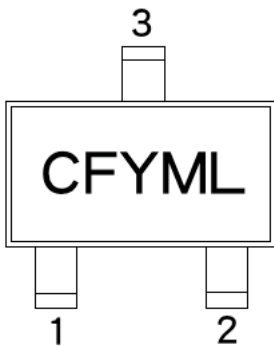


**SOT-23 Mechanical Drawing**



SOT-23 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX.
A	0.95 BSC		0.037 BSC	
A1	1.9 BSC		0.074 BSC	
B	2.60	3.00	0.102	0.118
C	1.40	1.70	0.055	0.067
D	2.80	3.10	0.110	0.122
E	1.00	1.30	0.039	0.051
F	0.00	0.10	0.000	0.004
G	0.35	0.50	0.014	0.020
H	0.10	0.20	0.004	0.008
I	0.30	0.60	0.012	0.024
J	5°	10°	5°	10°

**Marking Diagram**



- CF** = Device Code
- Y** = Year Code
- M** = Month Code
- (**A**=Jan, **B**=Feb, **C**=Mar, **D**=Apr, **E**=May, **F**=Jun, **G**=Jul, **H**=Aug, **I**=Sep, **J**=Oct, **K**=Nov, **L**=Dec)
- L** = Lot Code

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