

NPN Silicon Planar Medium Power Transistor

TO-92



Pin Definition:

1. Emitter
2. Base
3. Collector

PRODUCT SUMMARY

BV_{CBO}	150V
BV_{CEO}	60V
I_C	6A
$V_{CE(SAT)}$	0.55V @ $I_C / I_B = 6A / 300mA$

Features

- Excellent gain characteristics specified up to 10A

Structure

- Epitaxial Planar Type

Ordering Information

Part No.	Package	Packing
TSC5988CT B0	TO-92	1Kpcs / Bulk
TSC5988CT A3	TO-92	2Kpcs / Ammo

Absolute Maximum Rating (Ta = 25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Collector-Base Voltage	V_{CBO}	150	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current	I_C	DC	5
		Pulse	20
Total Power Dissipation	P_{tot}	1.0	W
Operating Junction Temperature	T_J	+150	°C
Operating Junction and Storage Temperature Range	T_{STG}	- 55 to +150	°C

Electrical Specifications (Ta = 25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage	$I_C = 100\mu A, I_E = 0$	BV_{CBO}	150	170	--	V
Collector-Emitter Breakdown Voltage	$I_C = 10mA, I_B = 0$	BV_{CEO}	60	70	--	V
Emitter-Base Breakdown Voltage	$I_E = 100\mu A, I_C = 0$	BV_{EBO}	6	8	--	V
Collector Cutoff Current	$V_{CB} = 120V, I_E = 0$	I_{CBO}	--	--	50	nA
	$V_{CB} = 120V, T_A = 100^\circ C$		--	--	1	uA
Emitter Cutoff Current	$V_{EB} = 6V, I_C = 0$	I_{EBO}	--	--	10	nA
Collector-Emitter Saturation Voltage	$I_C = 100mA, I_B = 5mA$	$V_{CE(SAT) 1}$	--	20	50	mV
	$I_C = 1A, I_B = 50mA$	$V_{CE(SAT) 2}$	--	80	120	
	$I_C = 2A, I_B = 100mA$	$V_{CE(SAT) 3}$	--	150	220	
	$I_C = 5A, I_B = 200mA$	$V_{CE(SAT) 4}$	--	260	--	
Base-Emitter Saturation Voltage	$I_C = 4A, I_B = 200mA$	$V_{BE(SAT)}$	--	920	1050	mV
Base-Emitter on Voltage	$V_{CE} = 1V, I_C = 6A$	$V_{BE(ON)}$	--	1.05	1.2	V
DC Current Transfer Ratio	$V_{CE} = 1V, I_C = 10mA$	$h_{FE 1}$	100	--	--	
	$V_{CE} = 1V, I_C = 2A$	$h_{FE 2}$	120	200	300	
	$V_{CE} = 1V, I_C = 5A$	$h_{FE 3}$	75	140	--	
	$V_{CE} = 1V, I_C = 10A$	$h_{FE 4}$	--	70	--	
Transition Frequency	$V_{CE} = 10V, I_C = 100mA$	f_T	--	130	--	MHz
Output Capacitance	$V_{CB} = 10V, f = 1MHz$	C_{ob}	--	72	--	pF

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

Figure 1. DC Current Gain vs. Collector Current

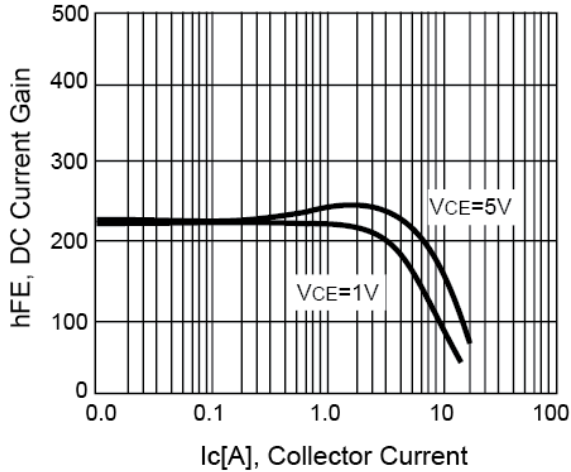


Figure 2. VCE(SAT) vs. Collector Current

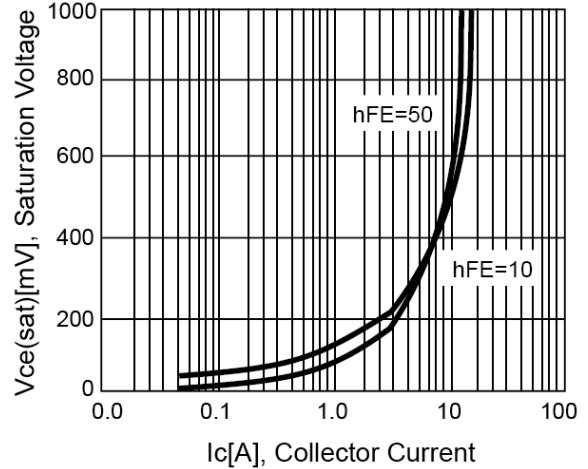


Figure 3. VBE(SAT) vs. Collector Current

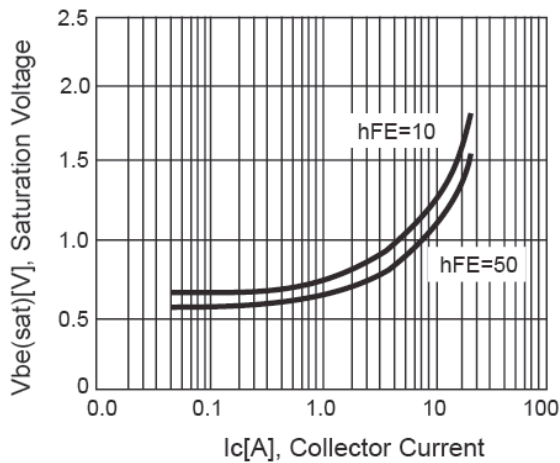


Figure 4. fT vs. Emitter Current

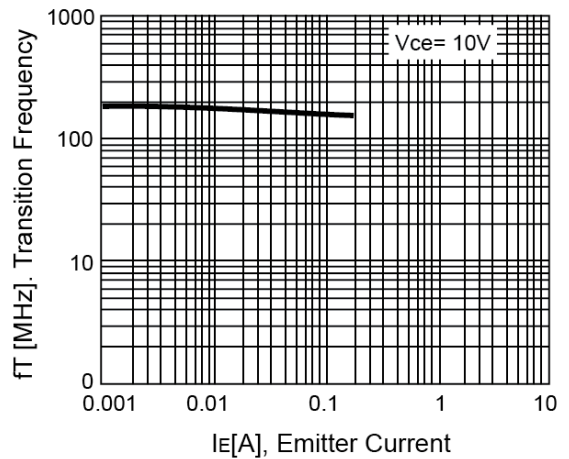


Figure 5. Cob vs. Collector-Base Voltage

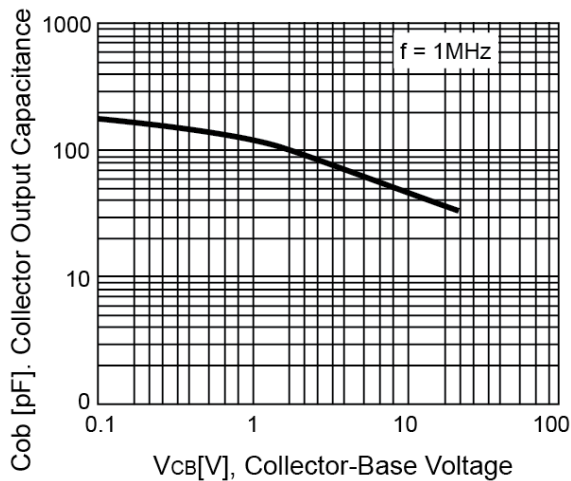
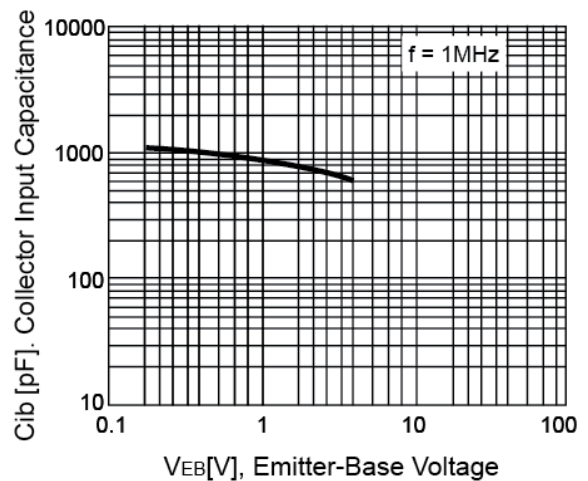


Figure 6. Cib vs. Emitter-Base Voltage



Electrical Characteristics Curve ($T_a = 25^\circ\text{C}$, unless otherwise noted)

Figure 7. Safety Operation Area

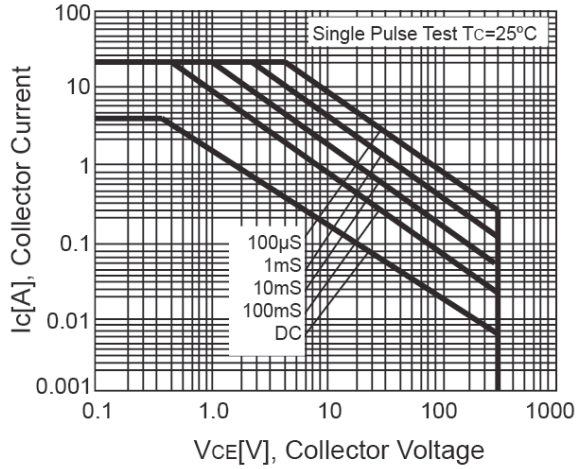
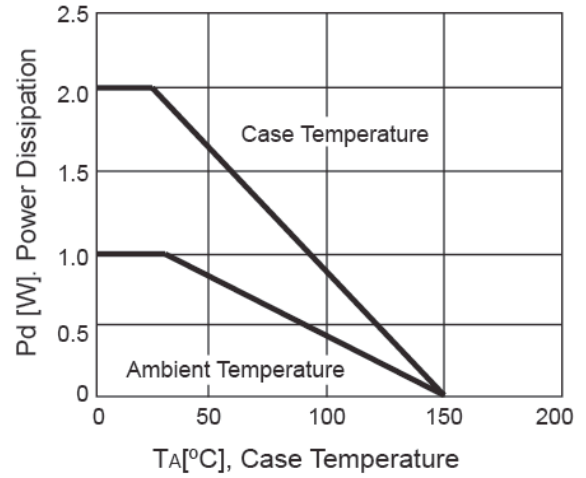
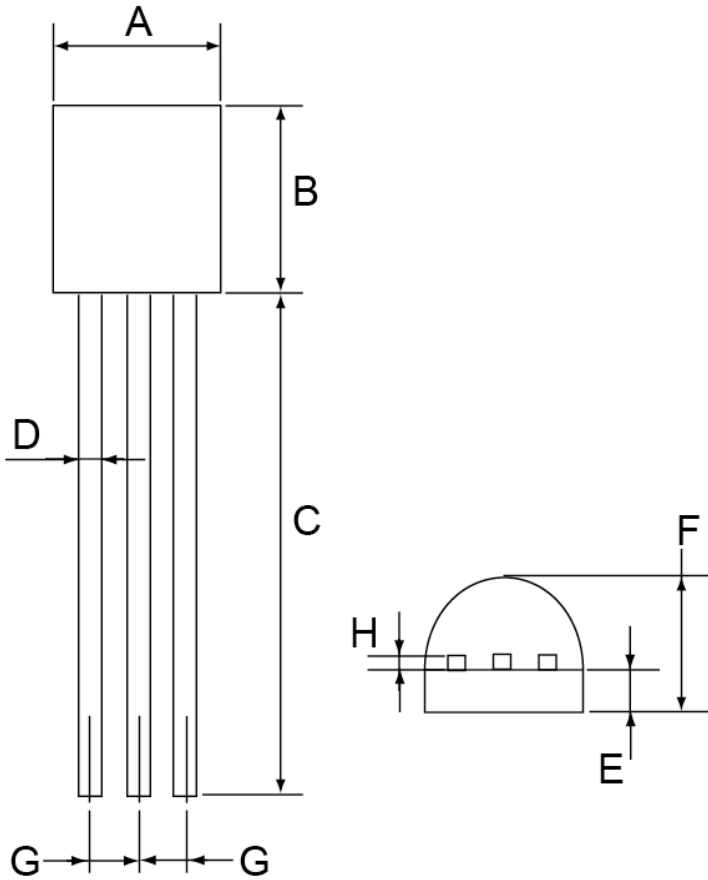


Figure 8. Derating Curve

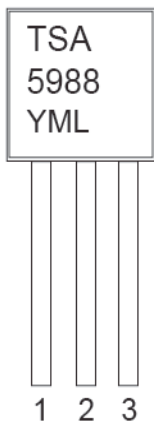


TO-92 Mechanical Drawing



TO-92 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.70	0.169	0.185
B	4.30	4.70	0.169	0.185
C	14.30(typ)		0.563(typ)	
D	0.43	0.49	0.017	0.019
E	1.18	1.28	0.046	0.050
F	3.30	3.70	0.130	0.146
G	1.27	1.31	0.05	0.051
H	0.37	0.43	0.015	0.017

Marking Diagram



- 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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