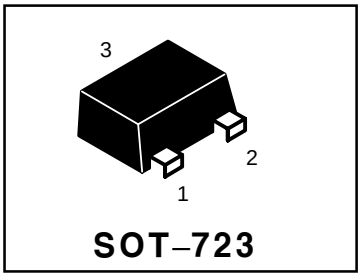
NPN Silicon General Purpose Amplifier Transistor

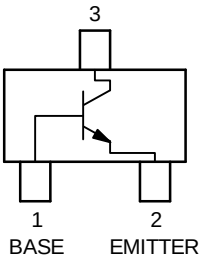
This NPN transistor is designed for general purpose amplifier applications. This device is housed in the SOT-723 package which is designed for low power surface mount applications, where board space is at a premium.



SOT–723

Features

- Reduces Board Space
- High h_{FE}, 210−460 (typical)
- Low $V_{CE(sat)}$ < 0.5 V
- ESD Performance: Human Body Model; > 2000 V,
  Machine Model; > 200 V



MAXIMUM RATINGS (T_A = 25℃)

Rating	Symbol	Value	Unit
Collector- Base Voltage	$V_{(BR)CBO}$	50	Vdc
Collector- Emitter Voltage	$V_{(BR)CEO}$	50	Vdc
Emitter- Base Voltage	$V_{(BR)EBO}$	5.0	Vdc
Collector Current−Continuous	I_C	100	mAdc

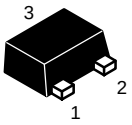
THERMAL CHARACTERISTICS

Rating	Symbol	Max	Unit
Power Dissipation (Note 1)	P_D	260	mW
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{stg}	−55 ~ +150	℃

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Device mounted on a FR-4 glasspoxy printed circuit board using the minimum recommended footprint.

MARKING DIAGRAM



SOT−723

XX = Specific Device Code
BQ = FTC5658Q
BR = FTC5658R

ORDERING INFORMATION

Device	Package	Shipping
FTC5658	SOT−723	8000/Tape & Reel

ELECTRICAL CHARACTERISTICS (TA=25℃)

Characteristic	Symbol	Min	Typ	Max	Unit
Collector-Base Breakdown Voltage (Ic= 50uAdc, IE= 0)	$V_{(BR)CBO}$	50	–	–	Vdc
Collector-Emitter Breakdown Voltage (Ic=1.0mAdc, IE= 0)	$V_{(BR)CEO}$	50	–	–	Vdc
Emitter-Base Breakdown Voltage (Ic= 50uAdc, IE= 0)	$V_{(BR)EBO}$	5.0	–	–	Vdc
Collector-Base Cutoff Current (Vcb= 30 Vdc, IE= 0)	I_{CBO}	–	–	0.5	μA
Emitter-Base Cutoff Current (VEB = 4.0 Vdc, IE = 0)	I_{EBO}	–	–	0.5	μA
Collector-Emitter Saturation Voltage (Note 2) (IC = 50 mAdc, IB = 5.0 mAdc)	$V_{CE(sat)}$	–	–	0.4	Vdc
DC Current Gain (Note 2) (VCE = 6.0 Vdc, IC = 1.0 mAdc) FTC5658Q (VCE = 6.0 Vdc, IC = 1.0 mAdc) FTC5658R	h_{FE}	 120 180	 – –	 270 390	–
Transition Frequency (VCE=12Vdc, IC=2.0mAdc, f=30MHz)	f_T	–	180	–	MHz
Output Capacitance (VCB =12 Vdc, IC =0 Adc, f =1.0 MHz)	C_{OB}	–	2.0	–	pF

2. Pulse Test: Pulse Width≤300us, D.C. ≤2%.

TYPICAL ELECTRICAL CHARACTERISTICS

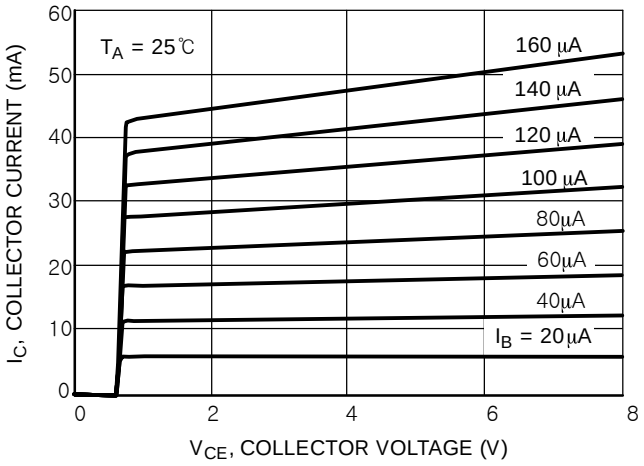


Figure 1. $I_C - V_{CE}$

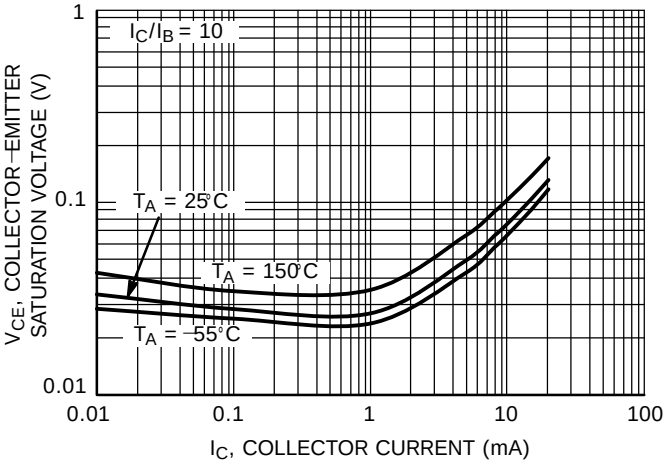


Figure 2. Collector Emitter Saturation Voltage vs. Collector Current

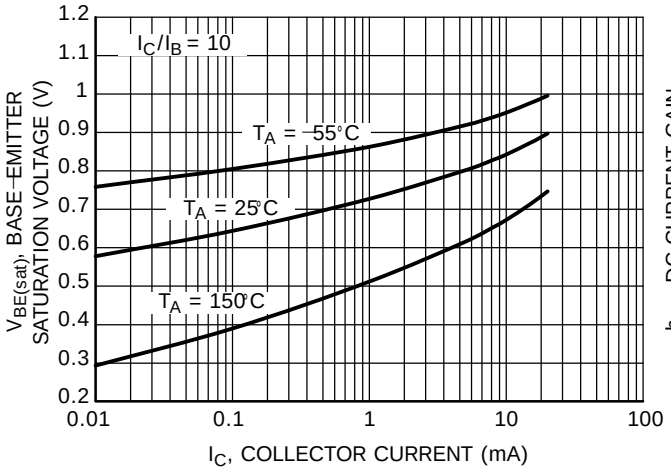


Figure 3. Base Emitter Saturation Voltage vs. Collector Current

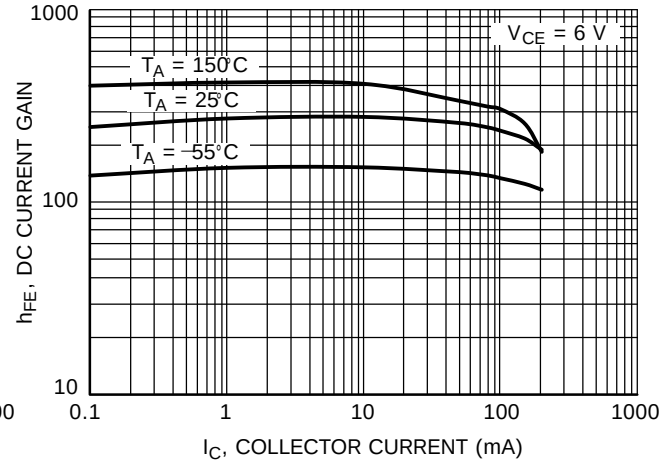


Figure 4. DC Current Gain vs. Collector Current

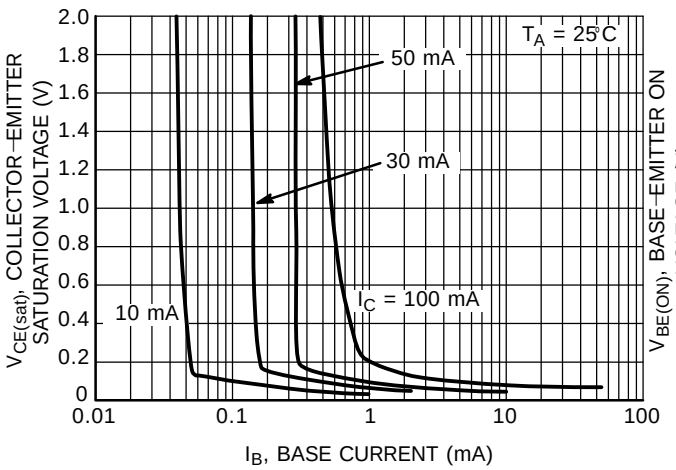


Figure 5. Saturation Region

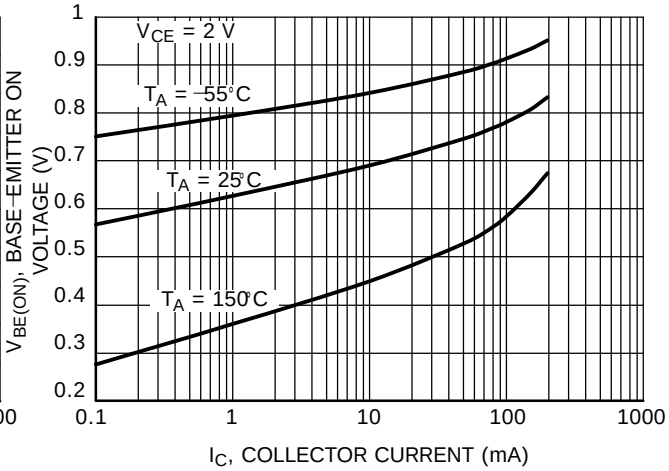


Figure 6. Base−E**mitter Tur**n−ON **Voltage vs. Collector Current**

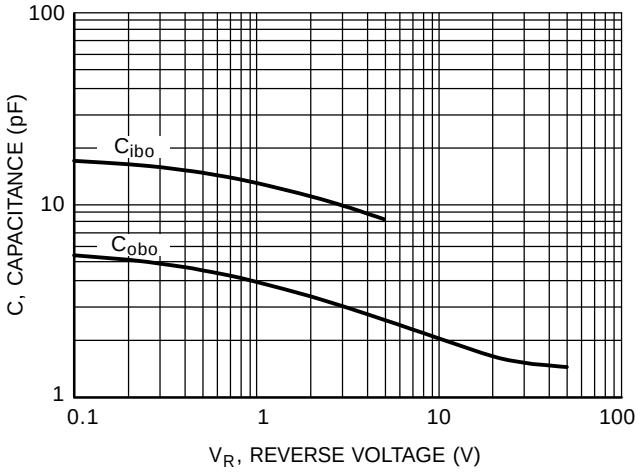


Figure 7. Capacitance

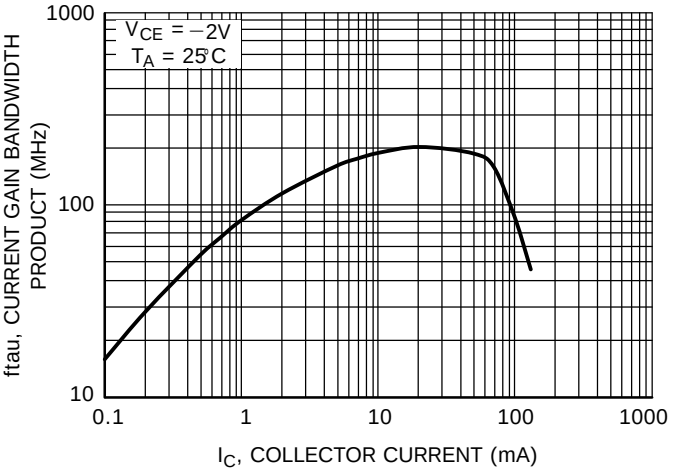


Figure 8. Current Gain Bandwidth Product vs. Collector Current

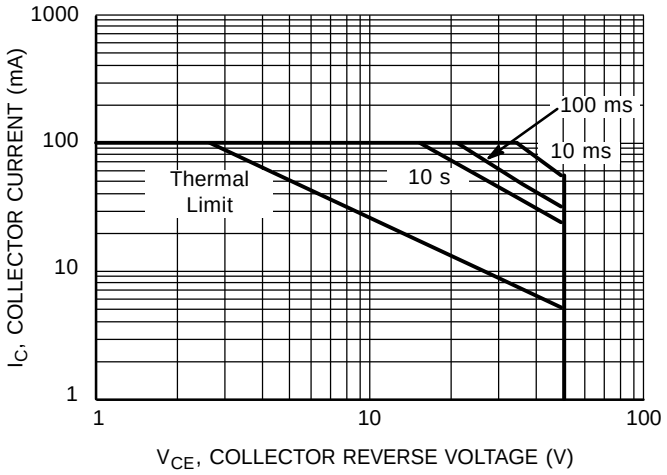
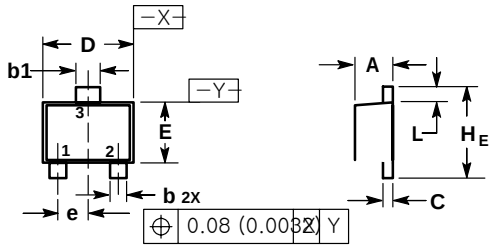


Figure 9. Safe Operating Area

SOT−723

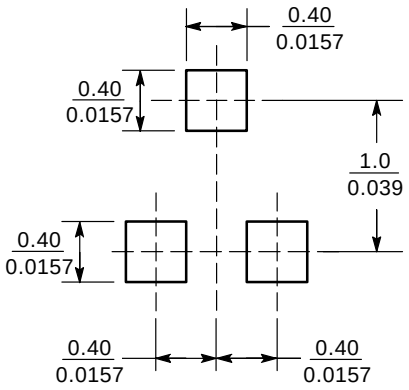


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

STYLE 1:
PIN 1. BASE
2. EMITTER
3. COLLECTOR

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.45	0.50	0.55	0.018	0.020	0.022
b	0.15	0.21	0.27	0.0059	0.0083	0.0106
b1	0.25	0.31	0.37	0.010	0.012	0.015
C	0.07	0.12	0.17	0.0028	0.0047	0.0067
D	1.15	1.20	1.25	0.045	0.047	0.049
E	0.75	0.80	0.85	0.03	0.032	0.034
e		0.40 BSC			0.016 BSC	
H E	1.15	1.20	1.25	0.045	0.047	0.049
L	0.15	0.20	0.25	0.0059	0.0079	0.0098

SOLDERING FOOTPRINT*



SCALE 20:1 (mm / inches)