

ON Semiconductor

Is Now



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BF393

High Voltage Transistor

NPN Silicon

Features

- Pb-Free Packages are Available*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	300	Vdc
Collector-Base Voltage	V_{CBO}	300	Vdc
Emitter-Base Voltage	V_{EBO}	6.0	Vdc
Collector Current - Continuous	I_C	500	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above = 25°C	P_D	625 5.0	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.5 12	W mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

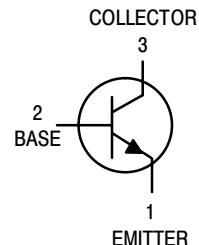
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	200	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	83.3	$^\circ\text{C/W}$

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

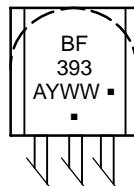


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MARKING DIAGRAM



BF393 = Device Code
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping [†]
BF393	TO-92	5000 Units / Box
BF393G	TO-92 (Pb-Free)	5000 Units / Box
BF393ZL1	TO-92	2000 / Tape & Reel
BF393ZL1G	TO-92 (Pb-Free)	2000 / Tape & Reel

[†]For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage (Note 1) ($I_C = 1.0 \text{ mA}$, $I_B = 0$)	$V_{(\text{BR})\text{CEO}}$	300	—	Vdc
Collector-Base Breakdown Voltage ($I_C = 100 \text{ }\mu\text{A}$, $I_E = 0$)	$V_{(\text{BR})\text{CBO}}$	300	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = 100 \text{ }\mu\text{A}$, $I_C = 0$)	$V_{(\text{BR})\text{EBO}}$	6.0	—	Vdc
Collector Cutoff Current ($V_{CB} = 200 \text{ Vdc}$, $I_E = 0$)	I_{CBO}	—	0.1	μA
Emitter Cutoff Current ($V_{EB} = 6.0 \text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	0.1	μA
ON CHARACTERISTICS				
DC Current Gain ($I_C = 1.0 \text{ mA}$, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 10 \text{ mA}$, $V_{CE} = 10 \text{ Vdc}$)	h_{FE}	25 40	— —	—
Collector-Emitter Saturation Voltage ($I_C = 20 \text{ mA}$, $I_B = 2.0 \text{ mA}$)	$V_{CE(\text{sat})}$	—	2.0	Vdc
Base-Emitter Saturation Voltage ($I_C = 20 \text{ mA}$, $I_B = 2.0 \text{ mA}$)	$V_{BE(\text{sat})}$	—	2.0	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Current Gain – Bandwidth Product ($I_C = 10 \text{ mA}$, $V_{CE} = 20 \text{ Vdc}$, $f = 20 \text{ MHz}$)	f_T	50	—	MHz
Common Emitter Feedback Capacitance ($V_{CB} = 60 \text{ Vdc}$, $I_E = 0$, $f = 1.0 \text{ MHz}$)	C_{re}	—	2.0	pF

1. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$; Duty Cycle $\leq 2.0\%$.

BF393

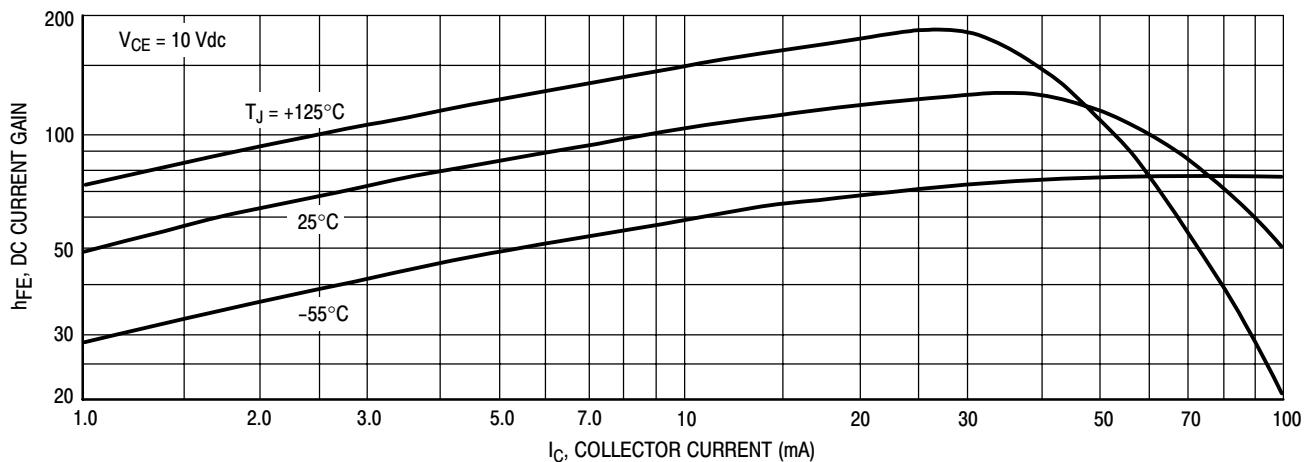


Figure 1. DC Current Gain

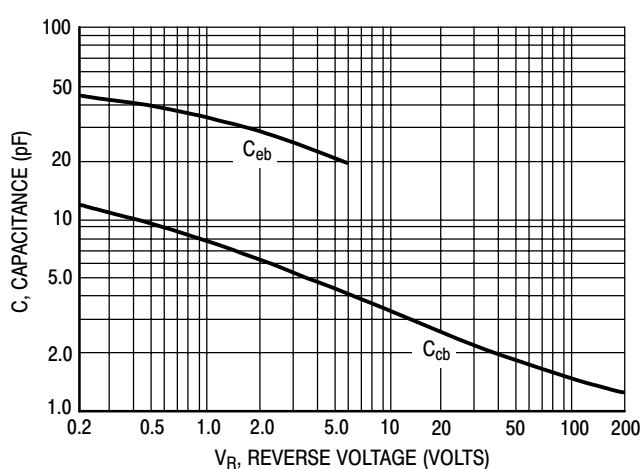


Figure 2. Capacitances

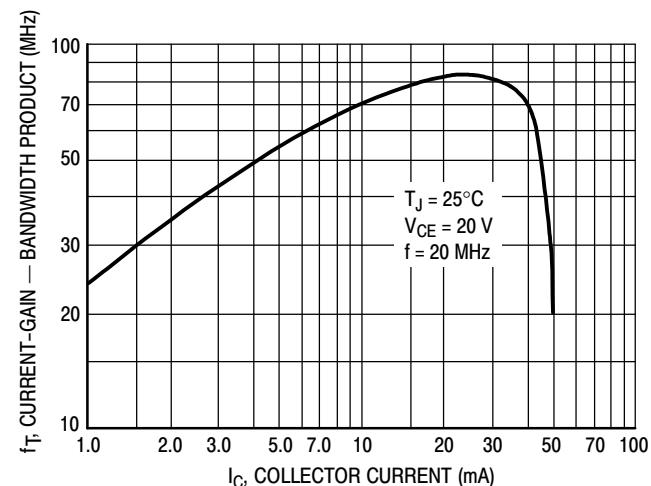


Figure 3. Current-Gain — Bandwidth Product

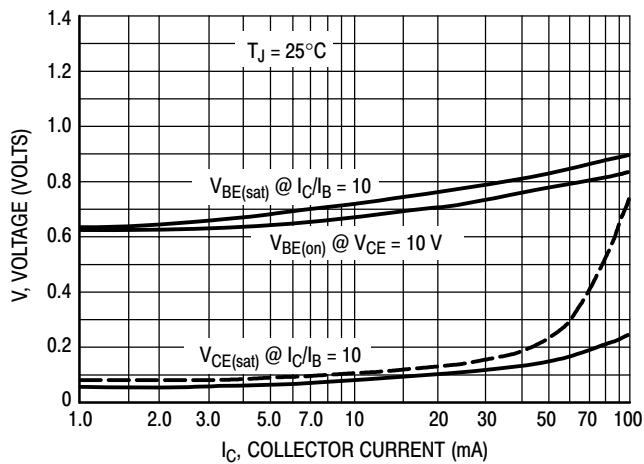


Figure 4. "On" Voltages

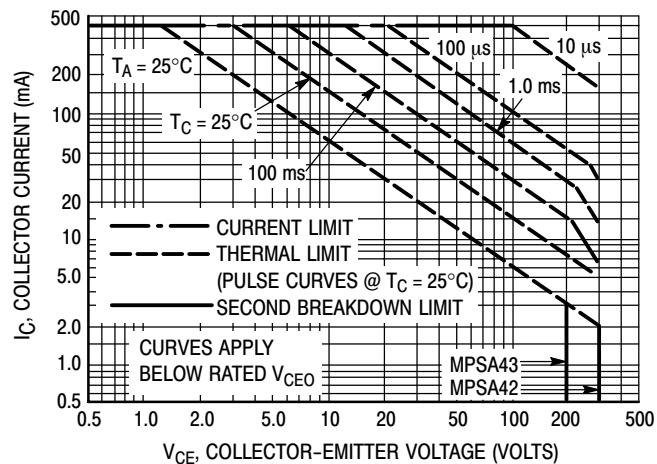
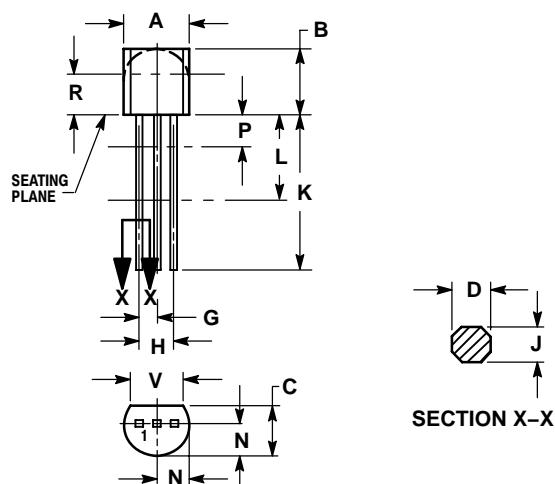


Figure 5. Maximum Forward Bias
Safe Operating Area

PACKAGE DIMENSIONS

TO-92 (TO-226)
CASE 29-11
ISSUE AL

NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.115	---	2.93	---
V	0.135	---	3.43	---

STYLE 1:
 PIN 1. Emitter
 2. Base
 3. Collector

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