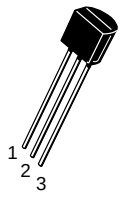
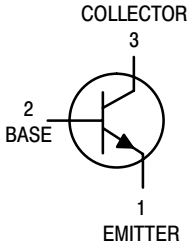
High Voltage Transistor
NPN Silicon

MPSA44

ON Semiconductor Preferred Device



CASE 29–11, STYLE 1
TO–92 (TO–226AA)



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	V_{CEO}	400	Vdc
Collector–Base Voltage	V_{CBO}	500	Vdc
Emitter–Base Voltage	V_{EBO}	6.0	Vdc
Collector Current — Continuous	I_C	300	mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	625 5.0	mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	1.5 12	Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–55 to +150	°C

THERMAL CHARACTERISTICS

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

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector–Emitter Breakdown Voltage[1] (I_C = 1.0 mAdc, I_B = 0)	$V_{(BR)CEO}$	400	—	Vdc
Collector–Emitter Breakdown Voltage (I_C = 100 μAdc, V_{BE} = 0)	$V_{(BR)CES}$	500	—	Vdc
Collector–Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	$V_{(BR)CBO}$	500	—	Vdc
Emitter–Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	$V_{(BR)EBO}$	6.0	—	Vdc
Collector Cutoff Current (V_{CB} = 400 Vdc, I_E = 0)	I_{CBO}	—	0.1	μAdc
Collector Cutoff Current (V_{CE} = 400 Vdc, V_{BE} = 0)	I_{CES}	—	500	nAdc
Emitter Cutoff Current (V_{EB} = 4.0 Vdc, I_C = 0)	I_{EBO}	—	0.1	μAdc

1. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

Preferred devices are ON Semiconductor recommended choices for future use and best overall value.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (Continued)

Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS(1)				
DC Current Gain(1)	h_{FE}			—
(I_C = 1.0 mAdc, V_{CE} = 10 Vdc)		40	—	
(I_C = 10 mAdc, V_{CE} = 10 Vdc)		50	200	
(I_C = 50 mAdc, V_{CE} = 10 Vdc)		45	—	
(I_C = 100 mAdc, V_{CE} = 10 Vdc)		40	—	
Collector–Emitter Saturation Voltage(1)	$V_{CE(sat)}$			Vdc
(I_C = 1.0 mAdc, I_B = 0.1 mAdc)		—	0.4	
(I_C = 10 mAdc, I_B = 1.0 mAdc)		—	0.5	
(I_C = 50 mAdc, I_B = 5.0 mAdc)		—	0.75	
Base–Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 1.0 mAdc)	$V_{BE(sat)}$	—	0.75	Vdc
SMALL–SIGNAL CHARACTERISTICS				
Output Capacitance (V_{CB} = 20 Vdc, I_E = 0, f = 1.0 MHz)	C_{obo}	—	7.0	pF
Input Capacitance (V_{EB} = 0.5 Vdc, I_C = 0, f = 1.0 MHz)	C_{ibo}	—	130	pF
Small–Signal Current Gain (I_C = 10 mAdc, V_{CE} = 10 Vdc, f = 20 MHz)	h_{fe}	1.0	—	—

1. Pulse Test: Pulse Width $\leq$ 300 μs, Duty Cycle $\leq$ 2.0%.

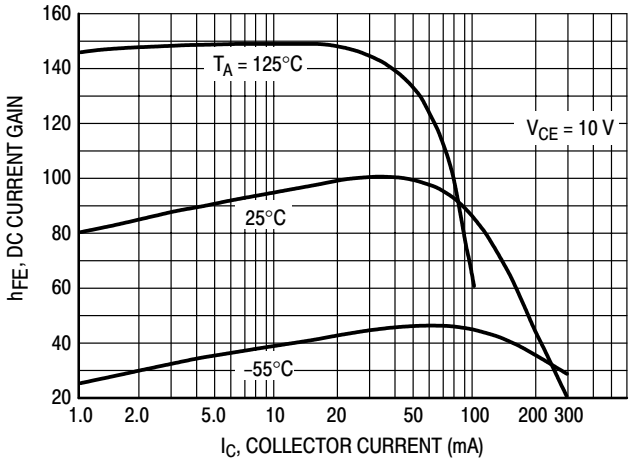


Figure 1. DC Current Gain

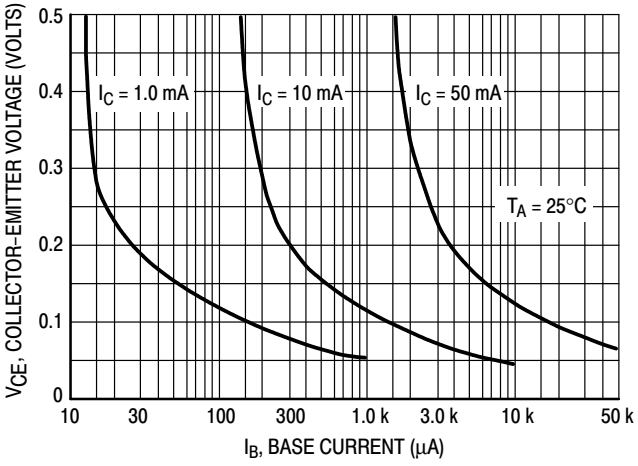


Figure 2. Collector Saturation Region

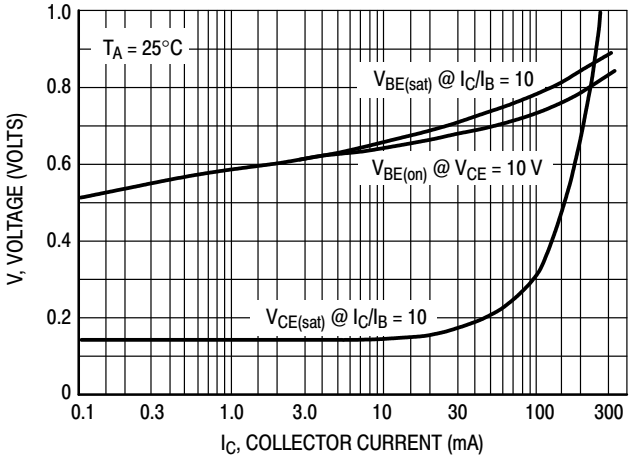


Figure 3. “On” Voltages

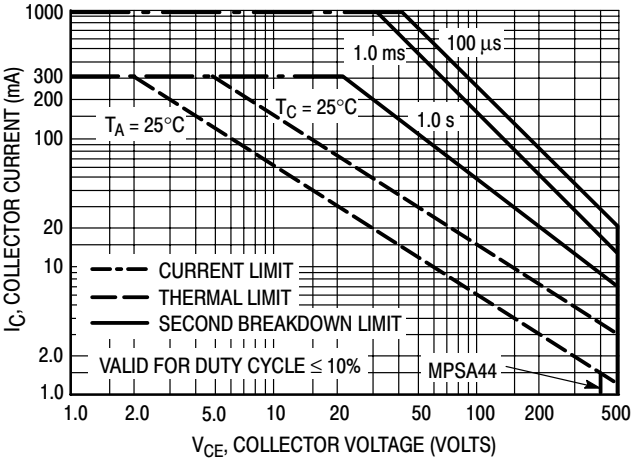


Figure 4. Active Region — Safe Operating Area

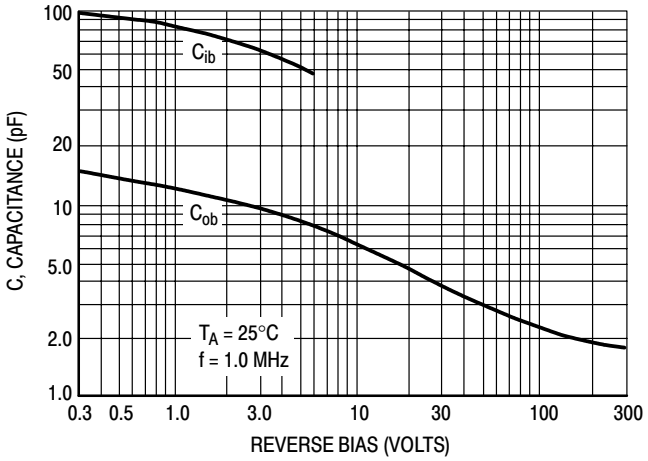


Figure 5. Capacitance

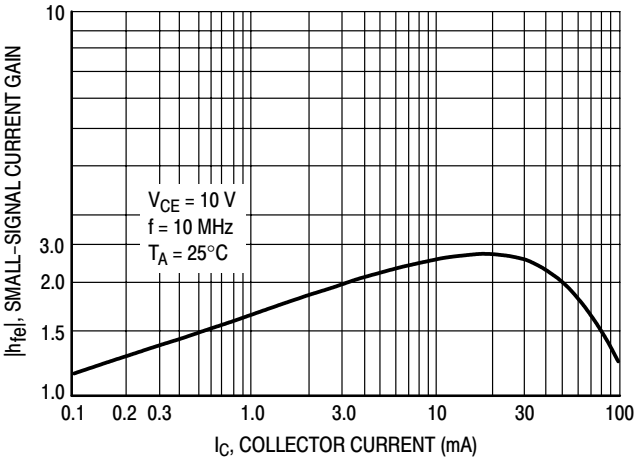


Figure 6. High Frequency Current Gain

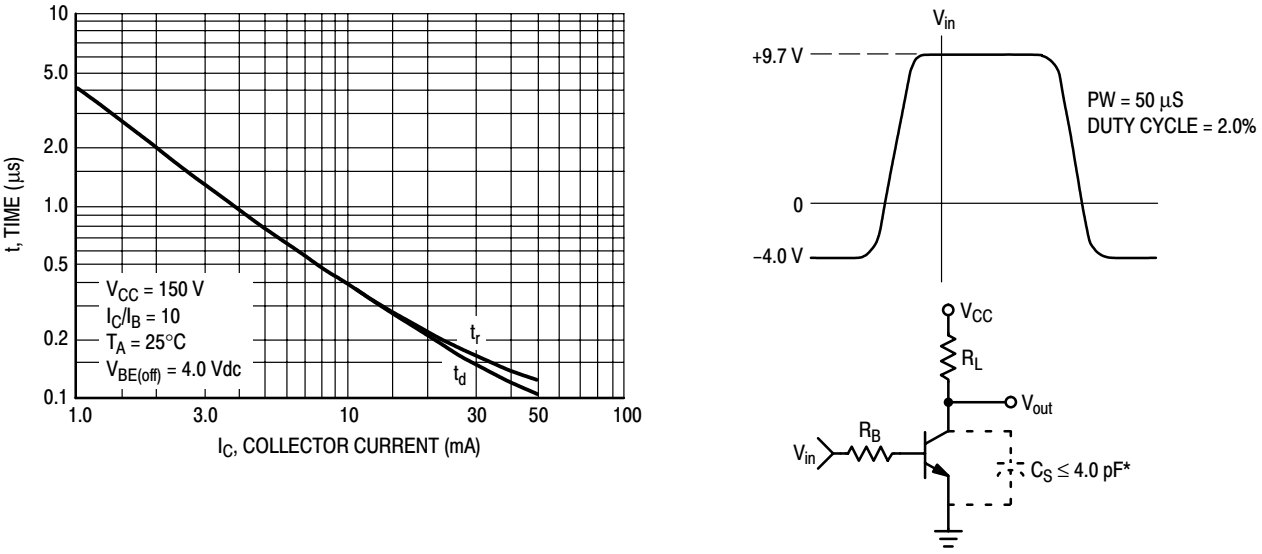


Figure 7. Turn−On Switching Times and Test Circuit

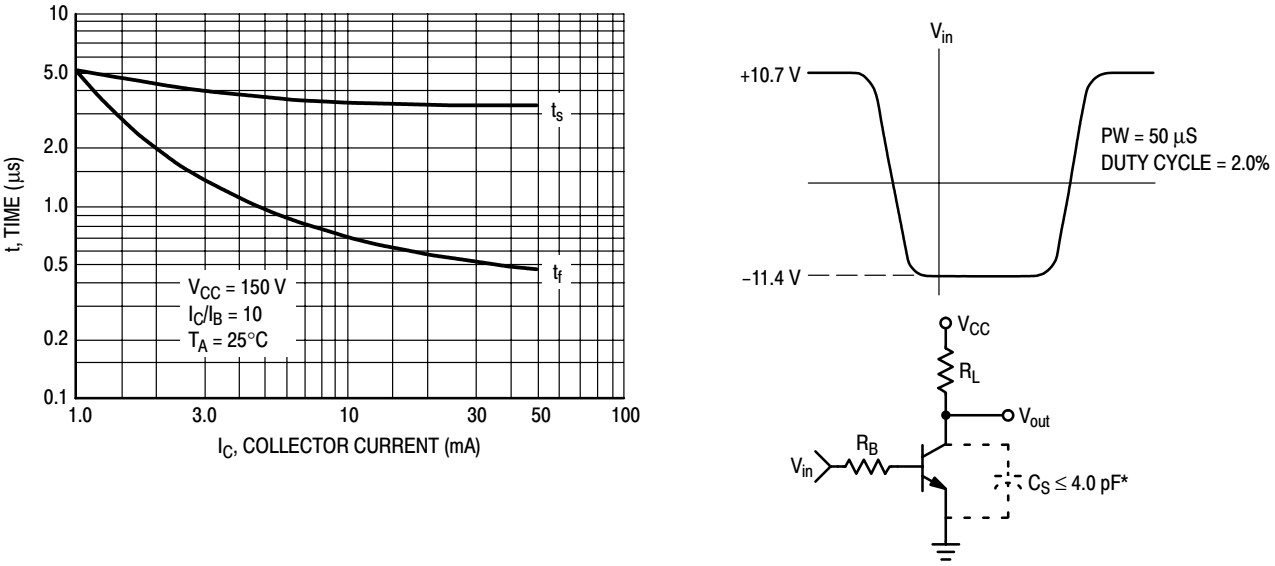
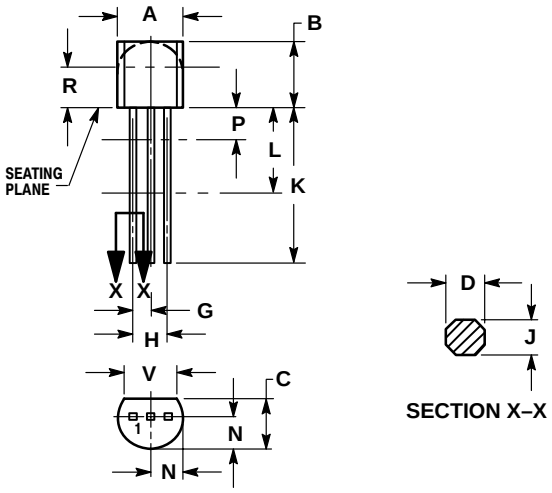


Figure 8. Turn−Off Switching Times and Test Circuit

*Total Shunt Capacitance or Test Jig and Connectors.

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.

	INCHES		MILLIMETERS	
DIM	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

Notes

Notes

PUBLICATION ORDERING INFORMATION

NORTH AMERICA Literature Fulfillment:
Literature Distribution Center for ON Semiconductor
P.O. Box 5163, Denver, Colorado 80217 USA
Phone: 303–675–2175 or 800–344–3860 Toll Free USA/Canada
Fax: 303–675–2176 or 800–344–3867 Toll Free USA/Canada
Email: ONlit@hibbertco.com
Fax Response Line: 303–675–2167 or 800–344–3810 Toll Free USA/Canada

N. American Technical Support: 800–282–9855 Toll Free USA/Canada

EUROPE: LDC for ON Semiconductor – European Support
German Phone: (+1) 303–308–7140 (Mon–Fri 2:30pm to 7:00pm CET)
Email: ONlit–german@hibbertco.com
French Phone: (+1) 303–308–7141 (Mon–Fri 2:00pm to 7:00pm CET)
Email: ONlit–french@hibbertco.com
English Phone: (+1) 303–308–7142 (Mon–Fri 12:00pm to 5:00pm GMT)
Email: ONlit@hibbertco.com

EUROPEAN TOLL–FREE ACCESS*: 00–800–4422–3781
*Available from Germany, France, Italy, UK, Ireland

CENTRAL/SOUTH AMERICA:
Spanish Phone: 303–308–7143 (Mon–Fri 8:00am to 5:00pm MST)
Email: ONlit–spanish@hibbertco.com
Toll–Free from Mexico: Dial 01–800–288–2872 for Access –
then Dial 866–297–9322

ASIA/PACIFIC: LDC for ON Semiconductor – Asia Support
Phone: 1–303–675–2121 (Tue–Fri 9:00am to 1:00pm, Hong Kong Time)
Toll Free from Hong Kong & Singapore:
001–800–4422–3781
Email: ONlit–asia@hibbertco.com

JAPAN: ON Semiconductor, Japan Customer Focus Center
4–32–1 Nishi–Gotanda, Shinagawa–ku, Tokyo, Japan 141–0031
Phone: 81–3–5740–2700
Email: r14525@onsemi.com

ON Semiconductor Website: http://onsemi.com

For additional information, please contact your local
Sales Representative.