

One Watt Darlington Transistors

PNP Silicon

MPSW63
MPSW64*

*ON Semiconductor Preferred Device

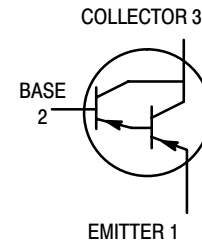
CASE 29-10, STYLE 1
TO-92 (TO-226AE)

MAXIMUM RATINGS

Rating	Symbol	MPSW63 MPSW64	Unit
Collector–Emitter Voltage	V_{CES}	–30	Vdc
Collector–Base Voltage	V_{CBO}	–30	Vdc
Emitter–Base Voltage	V_{EBO}	–10	Vdc
Collector Current — Continuous	I_C	–500	mAdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	1.0 8.0	Watt mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	2.5 20	Watts 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	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	50	$^\circ\text{C}/\text{W}$



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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector–Emitter Breakdown Voltage ($I_C = -100 \mu\text{Adc}, V_{BE} = 0$)	$V_{(BR)CES}$	–30	—	Vdc
Collector Cutoff Current ($V_{CB} = -30 \text{ Vdc}, I_E = 0$)	I_{CBO}	—	–100	nAdc
Emitter Cutoff Current ($V_{EB} = -10 \text{ Vdc}, I_C = 0$)	I_{EBO}	—	–100	nAdc

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

MPSW63 MPSW64

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

Characteristic	Symbol	Min	Max	Unit
ON CHARACTERISTICS⁽¹⁾				
DC Current Gain ($I_C = -10\text{ mAdc}$, $V_{CE} = -5.0\text{ Vdc}$)	h_{FE}	5,000	—	—
	MPSW63 MPSW64	10,000	—	—
($I_C = -100\text{ mAdc}$, $V_{CE} = -5.0\text{ Vdc}$)	MPSW63	10,000	—	—
	MPSW64	20,000	—	—
Collector–Emitter Saturation Voltage ($I_C = -100\text{ mAdc}$, $I_B = -0.1\text{ mAdc}$)	$V_{CE(sat)}$	—	-1.5	Vdc
Base–Emitter On Voltage ($I_C = -100\text{ mAdc}$, $V_{CE} = -5.0\text{ Vdc}$)	$V_{BE(on)}$	—	-2.0	Vdc
SMALL-SIGNAL CHARACTERISTICS				
Current–Gain — Bandwidth Product ⁽²⁾ ($I_C = -10\text{ mAdc}$, $V_{CE} = -5.0\text{ Vdc}$, $f = 100\text{ MHz}$)	f_T	125	—	MHz

1. Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$.
2. $f_T = |h_{fe}| \cdot f_{test}$.

TYPICAL ELECTRICAL CHARACTERISTICS

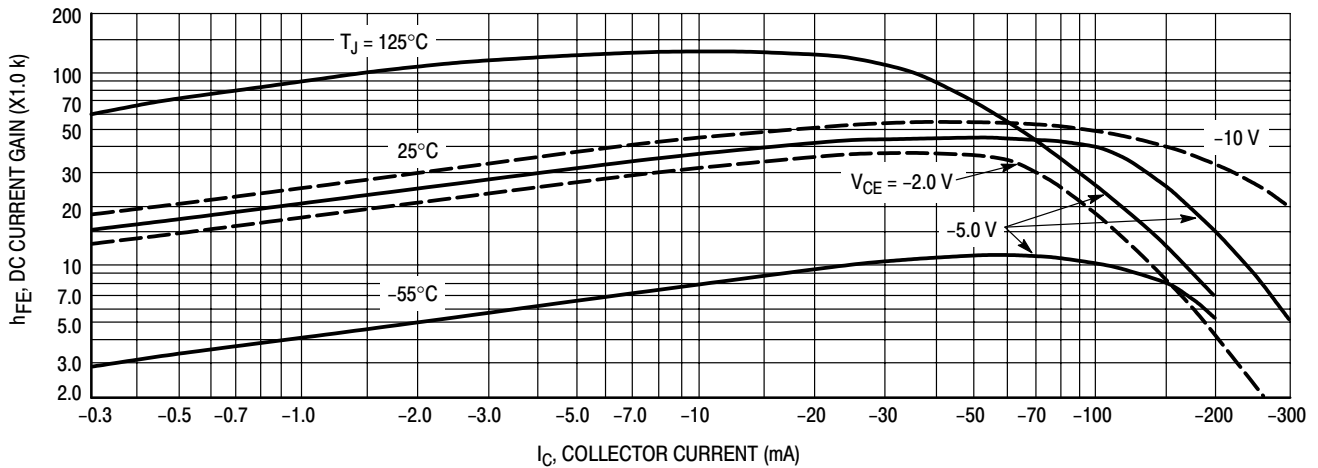


Figure 1. DC Current Gain

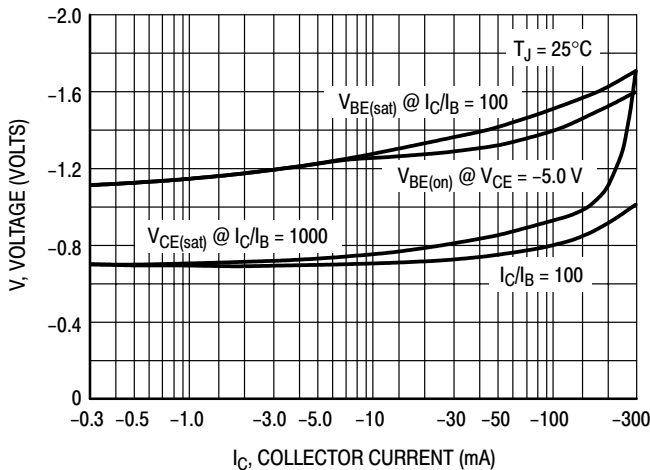


Figure 2. "ON" Voltage

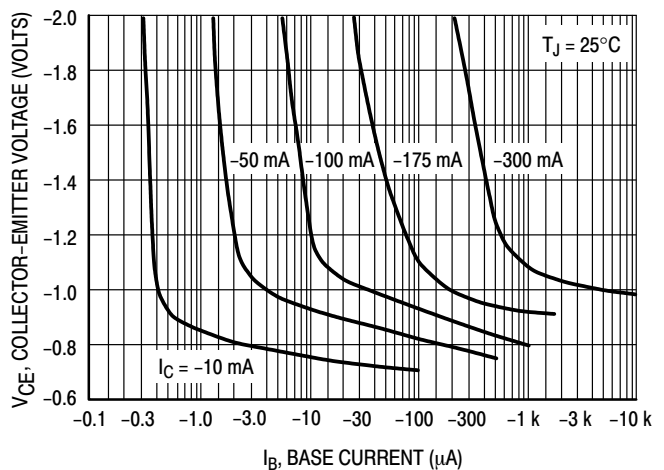


Figure 3. Collector Saturation Region

MPSW63 MPSW64

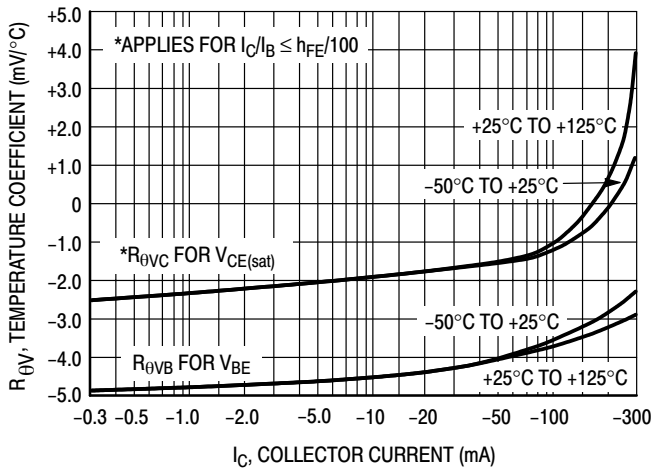


Figure 4. Temperature Coefficients

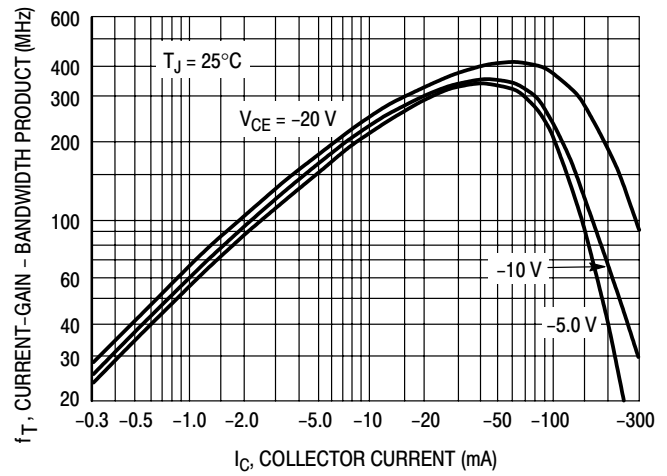


Figure 5. Current-Gain — Bandwidth Product

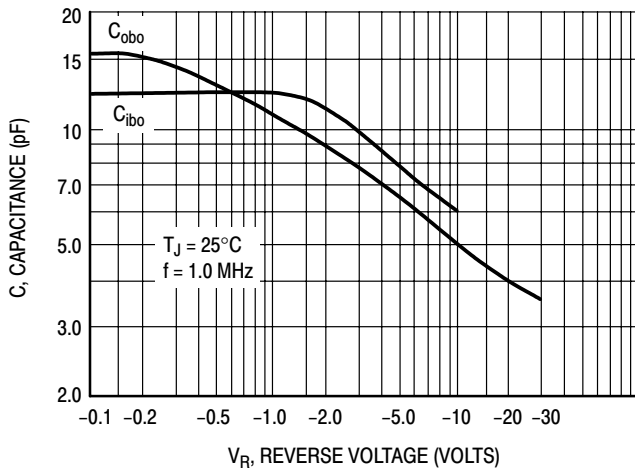


Figure 6. Capacitance

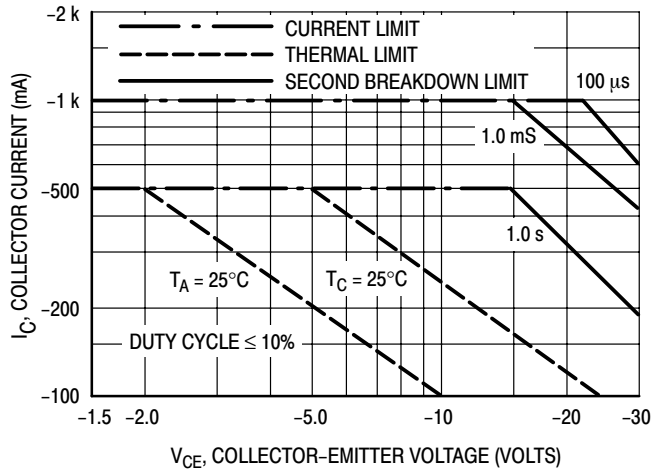
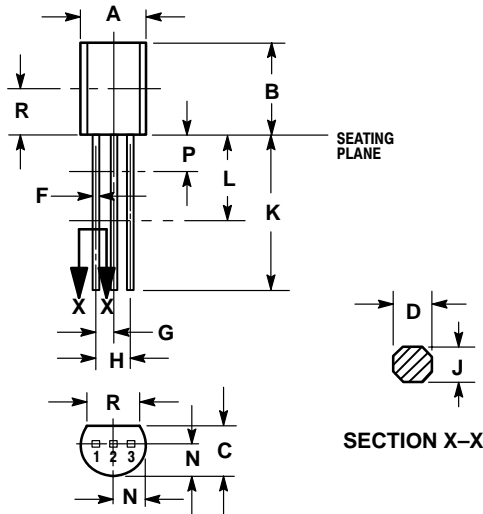


Figure 7. Active Region, Safe Operating Area

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PACKAGE DIMENSIONS

TO-92 (TO-226)
CASE 29-10
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. DIMENSION F APPLIES BETWEEN P AND L. DIMENSIONS D AND J APPLY BETWEEN L AND K MINIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.44	5.21
B	0.290	0.310	7.37	7.87
C	0.125	0.165	3.18	4.19
D	0.018	0.021	0.457	0.533
F	0.016	0.019	0.407	0.482
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.018	0.024	0.46	0.61
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	0.135	---	3.43	---

TYPE 1:

1. EMITTER
2. BASE
3. COLLECTOR

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