

# MPSA12

## Darlington Transistors

### NPN Silicon

#### Features

- Pb-Free Packages are Available\*

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector–Emitter Voltage	$V_{CES}$	20	Vdc
Emitter Base Voltage	$V_{EBO}$	10	Vdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	625 5.0	mW 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	$^\circ\text{C/W}$

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.

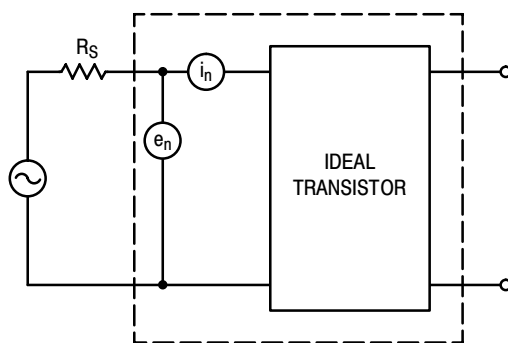


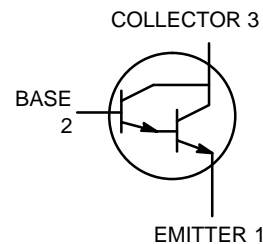
Figure 1. Transistor Noise Model

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

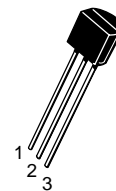


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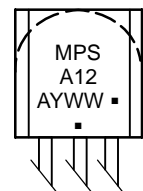
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#### MARKING DIAGRAM



**TO-92  
CASE 29-11  
STYLE 1**



MPSA12 = 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 <sup>†</sup>
MPSA12	TO-92	5,000 Units/Box
MPSA12G	TO-92 (Pb-Free)	5,000 Units/Box
MPSA12RLRA	TO-92	2,000/Tape & Reel
MPSA12RLRAG	TO-92 (Pb-Free)	2,000/Tape & Reel
MPSA12RLRP	TO-92	2,000/Tape & Reel
MPSA12RLRPG	TO-92 (Pb-Free)	2,000/Tape & Reel

<sup>†</sup>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.

# MPSA12

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector – Emitter Breakdown Voltage ( $I_C = 100\ \mu\text{A}$ , $I_B = 0$ )	$V_{(BR)CES}$	20	–	Vdc
Collector Cutoff Current ( $V_{CB} = 15\ \text{Vdc}$ , $I_E = 0$ )	$I_{CBO}$	–	100	nA
Emitter Cutoff Current ( $V_{EB} = 12\ \text{Vdc}$ , $I_C = 0$ )	$I_{EBO}$	–	100	nA
<b>ON CHARACTERISTICS</b>				
DC Current Gain ( $I_C = 10\ \text{mA}$ , $V_{CE} = 5.0\ \text{Vdc}$ )	$h_{FE}$	20,000	–	–
Collector – Emitter Saturation Voltage ( $I_C = 10\ \text{mA}$ , $I_B = 0.01\ \text{mA}$ )	$V_{CE(sat)}$	–	1.0	Vdc
Base – Emitter On Voltage ( $I_C = 10\ \text{mA}$ , $V_{CE} = 5.0\ \text{Vdc}$ )	$V_{BE(on)}$	–	1.4	Vdc

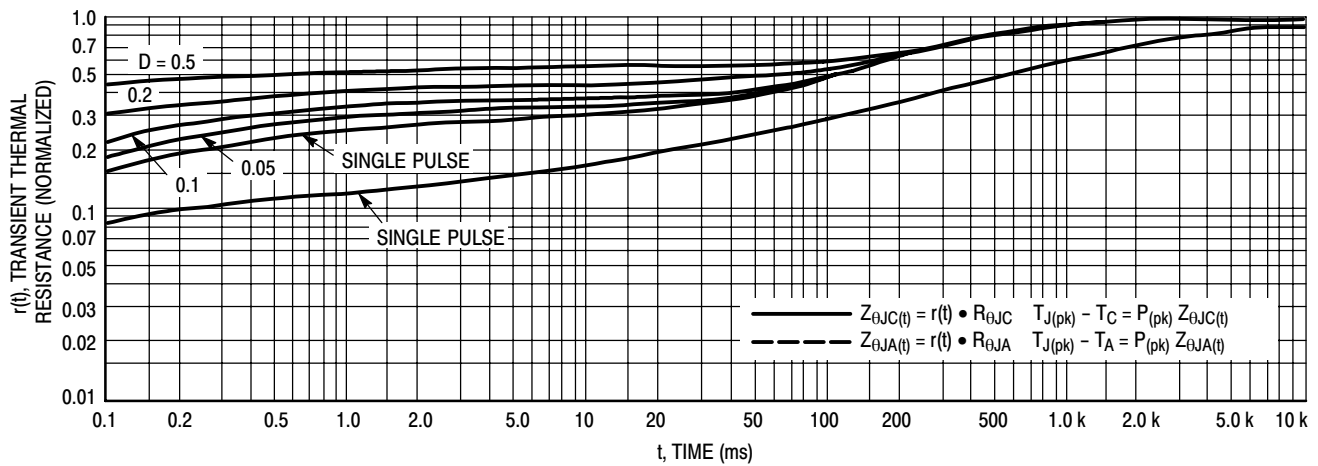
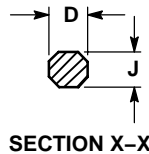
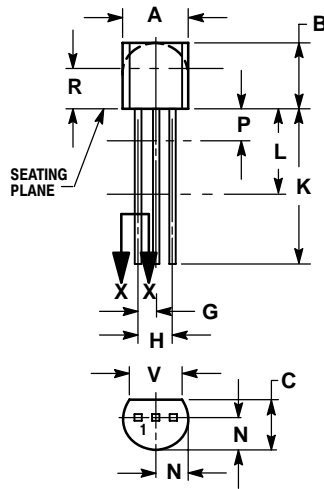


Figure 2. Thermal Response

# MPSA12

## 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:

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

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