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## MPSA12

### Silicon NPN Transistor

### Darlington, General Purpose Amplifier,

### TO-92 Type Package

**Absolute Maximum Ratings:** ( $T_A = +25^\circ\text{C}$ , Note 1, Note 2 unless otherwise specified)

Collector–Emitter Voltage, $V_{CES}$ .....	20V
Collector–Base Voltage, $V_{CEO}$ .....	20V
Emitter–Base Voltage, $V_{EBO}$ .....	10V
Continuous Collector Current, $I_C$ .....	1.2A
Total Device Dissipation ( $T_A = +25^\circ\text{C}$ ), $P_D$ .....	625mW
Derate Above $25^\circ\text{C}$ .....	5mW/ $^\circ\text{C}$
Operating Junction Temperature Range, $T_J$ .....	$-55^\circ$ to $+150^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-55^\circ$ to $+150^\circ\text{C}$
Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....	83.3 $^\circ\text{C}/\text{W}$
Thermal Resistance, Junction–to–Ambient, $R_{thJA}$ .....	200 $^\circ\text{C}/\text{W}$

Note 1. Maximum Ratings are those values beyond which device damage can occur. Maximum Ratings applied to the device are individual stress level 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.

Note 2. These are steady state limits and based on a maximum junction temperature of  $+150^\circ\text{C}$ .

**Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Collector–Emitter Breakdown Voltage	$V_{(BR)CES}$	$I_C = 100\mu\text{A}$ , $I_E = 0$	20	–	–	V
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 15\text{V}$ , $I_E = 0$	–	–	100	nA
	$I_{CES}$	$V_{CE} = 15\text{V}$ , $I_C = 0$	–	–	100	nA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 10\text{V}$ , $I_C = 0$	–	–	100	nA
<b>ON Characteristics (Note 3)</b>						
DC Current Gain	$h_{FE}$	$I_C = 10\text{mA}$ , $V_{CE} = 5\text{V}$	20,000	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10\text{mA}$ , $I_B = 0.01\text{mA}$	–	–	1.0	V
Base–Emitter ON Voltage	$V_{BE(on)}$	$I_C = 10\text{mA}$ , $V_{CE} = 5\text{V}$	–	–	1.4	V

Note 3. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

