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October 2014

MPSA42 / MMBTA42 / PZTA42 NPN High-Voltage Amplifier

Features

- This device is designed for application as a video output and other high-voltage applications.
- · Sourced from process 48.



Ordering Information

Part Number	Top Mark	Package	Packing Method
MPSA42	MPSA42	TO-92 3L	Bulk
MMBTA42	1D	SOT-23 3L	Tape and Reel
PZTA42	A42	SOT-223 4L	Tape and Reel

Absolute Maximum Ratings(1), (2)

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at $T_A = 25^{\circ}\text{C}$ unless otherwise noted.

Symbol	Parameter	Value	Unit
V _{CEO}	Collector-Emitter Voltage	300	V
V_{CBO}	Collector-Base Voltage	300	V
V _{EBO}	Emitter-Base Voltage	6	V
I _C	Collector Current - Continuous	500	mA
T _{J,} T _{STG}	Operating and Storage Junction Temperature Range	-55 to +150	°C

Notes:

- 1. These ratings are based on a maximum junction temperature of 150°C.
- 2. These are steady-state limits. Fairchild Semiconductor should be consulted on applications involving pulsed or low-duty-cycle operations.

Thermal Characteristics

Values are at $T_A = 25$ °C unless otherwise noted.

Symbol	Parameter	Max.			Unit
Symbol	Faiametei	MPSA42	MMBTA42 ⁽³⁾	PZTA42 ⁽⁴⁾	Oilit
P _D	Total Device Dissipation	625	240	1000	mW
	Derate Above 25°C	5.00	1.92	8.00	mW/°C
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	83.3			°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	200	515	125	°C/W

Notes:

- 3. Device is mounted on FR-4 PCB 1.6 inch x 1.6 inch x 0.06 inch.
- 4. Device is mounted on FR-4 PCB 36 mm x 18 mm x 1.5 mm, mounting pad for the collector lead minimum 6 cm².

Electrical Characteristics

Values are at $T_A = 25$ °C unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Max.	Unit
Off Characteristics					
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage ⁽⁵⁾	$I_C = 1.0 \text{ mA}, I_B = 0$	300		V
V _{(BR)CBO}	Collector-Base Breakdown Voltage	$I_C = 100 \mu A, I_E = 0$	300		V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage	$I_E = 100 \mu A, I_C = 0$	6		V
I _{CBO}	Collector Cut-Off Current	V _{CB} = 200 V, I _E = 0		0.1	μΑ
I _{EBO}	Emitter Cut-Off Current	$V_{EB} = 6 \text{ V}, I_{C} = 0$		0.1	μΑ
On Charact	eristics ⁽⁵⁾			•	
		$V_{CE} = 10 \text{ V}, I_{C} = 1.0 \text{ mA}$	25		
h _{FE}	DC Current Gain	V _{CE} = 10 V, I _C = 10 mA	40		
		$V_{CE} = 10 \text{ V}, I_{C} = 30 \text{ mA}$	40		
V _{CE(sat)}	Collector-Emitter Saturation Voltage	$I_C = 20 \text{ mA}, I_B = 2.0 \text{ mA}$		0.5	V
V _{BE(sat)}	Base-Emitter Saturation Voltage	$I_C = 20 \text{ mA}, I_B = 2.0 \text{ mA}$		0.9	V
Small Signa	al Characteristics				
f _T	Current Gain - Bandwidth Product	I _C = 10 mA, V _{CE} = 20 V, f = 100 MHz	50		MHz
C _{cb}	Collector-Base Capacitance	V _{CB} = 20 V, I _E = 0, f = 1.0 MHz		3.0	pF

Notes:

5. Pulse test: pulse width $\leq 300~\mu s,$ duty cycle $\leq 2\%.$

Typical Performance Characteristics

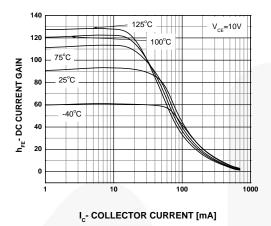
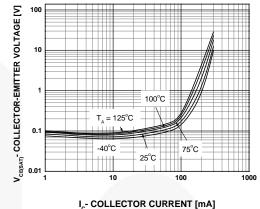
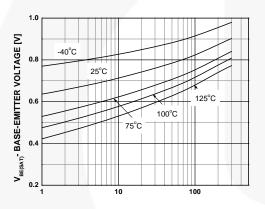


Figure 1. DC Current Gain vs. Collector Current

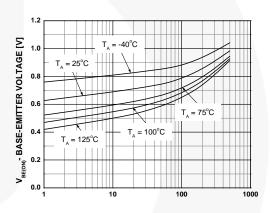


I_c- COLLECTOR CORRENT [maj

Figure 2. Collector-Emitter Saturation Voltage vs. Collector Current



I_c- COLLECTOR CURRENT [mA]



I_- COLLECTOR CURRENT [mA]

Figure 3. Base-Emitter Saturation Voltage vs. Collector Current

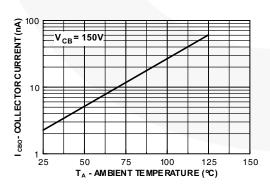
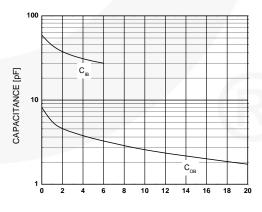


Figure 5. Collector Cut-Off Current vs. Ambient Temperature

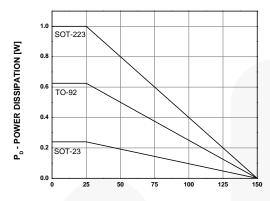




REVERSE BIAS VOLTAGE [V]

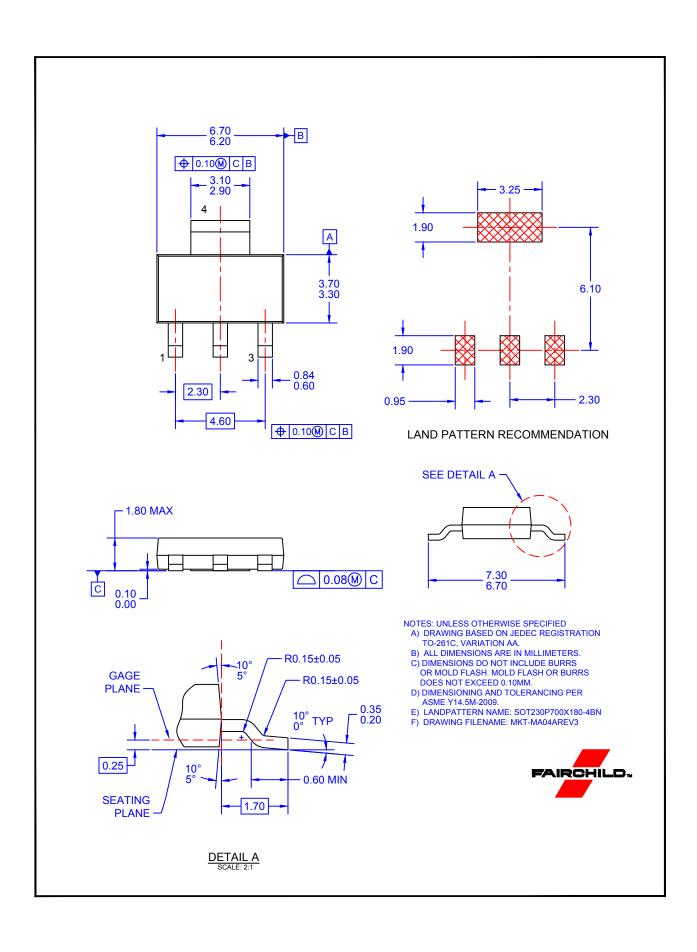
Figure 6. Collector-Base and Emitter-Base Capacitance vs. Reverse-Bias Voltage

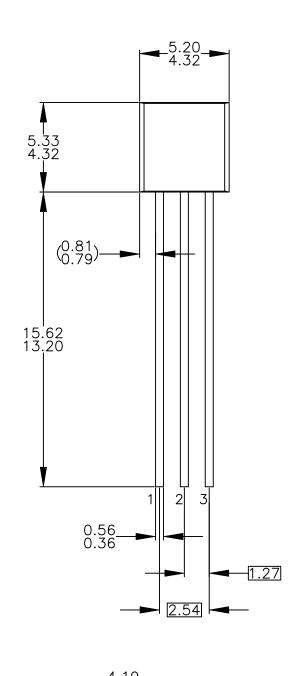
Typical Performance Characteristics (Continued)

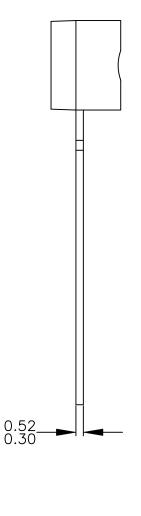


 T_c - CASE TEMPERATURE [°C]

Figure 7. Power Dissipation vs. Ambient Temperature

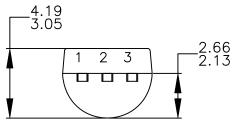




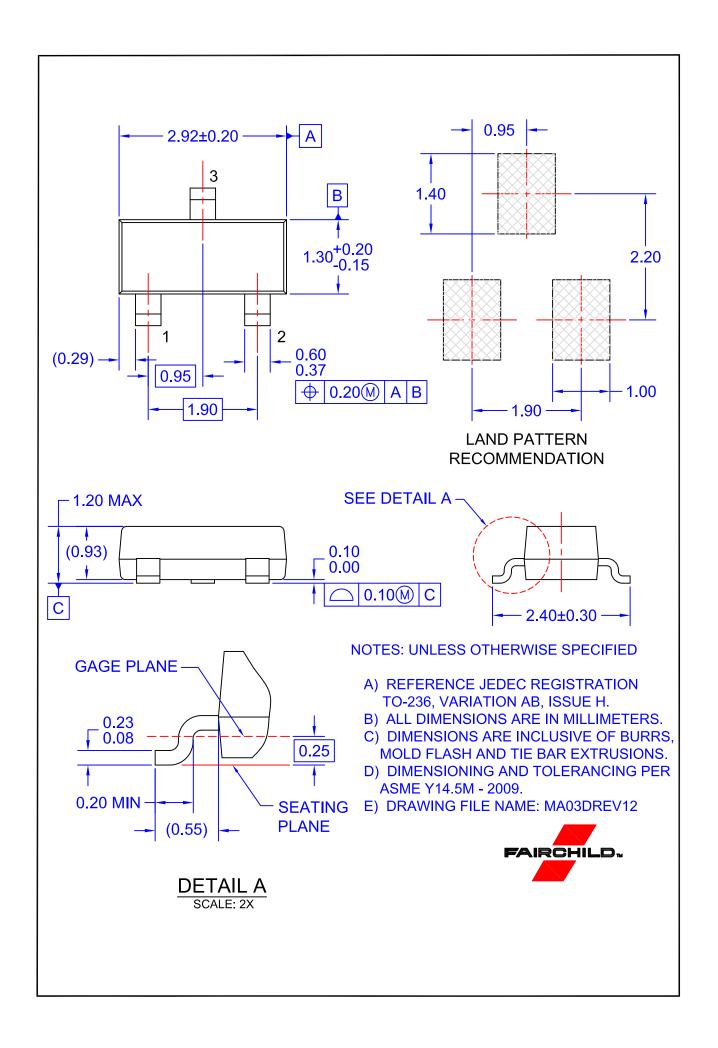


NOTES: UNLESS OTHERWISE SPECIFIED

- DRAWING WITH REFERENCE TO JEDEC TO-92 RECOMMENDATIONS.
 ALL DIMENSIONS ARE IN MILLIMETERS.
 DRAWING CONFORMS TO ASME Y14.5M-2009.
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Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001 Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

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