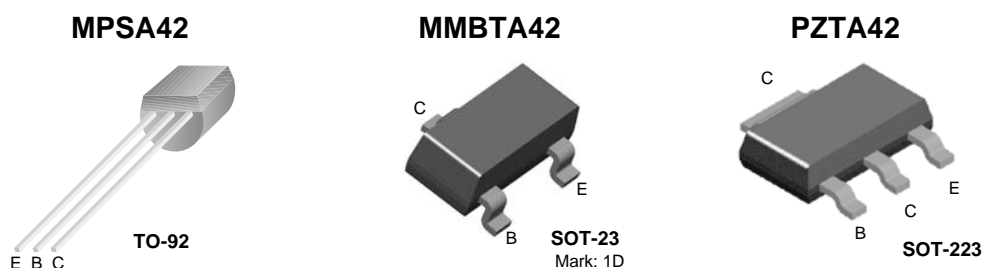


# MPSA42 / MMBTA42 / PZTA42

## NPN High Voltage Amplifier

### Features

- This device is designed for application as a video output to drive color CRT and other high voltage applications.
- Sourced from Process 48.



### Absolute Maximum Ratings\* $T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
$V_{CEO}$	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	$^\circ\text{C}$

\* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

#### NOTES:

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

### Thermal Characteristics $T_A=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Max			Units
		MPSA42	*MMBTA42	**PZTA42	
$P_D$	Total Device Dissipation	625	240	1000	mW
	Derate above $25^\circ\text{C}$	5.0	1.92	8.0	mW/ $^\circ\text{C}$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	83.3			$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	200	515	125	$^\circ\text{C}/\text{W}$

\* Device mounted on FR-4PCB  $1.6'' \times 1.6'' \times 0.06''$ .

\*\* Device mounted on FR-4 PCB  $36 \text{ mm} \times 18 \text{ mm} \times 1.5 \text{ mm}$ ; mounting pad for the collector lead min.  $6 \text{ cm}^2$ .

**Electrical Characteristics**  $T_A=25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units
<b>Off Characteristics</b>					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	$I_C = 1.0 \text{ mA}, I_B = 0$	300		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 100 \mu\text{A}, I_E = 0$	300		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 100 \mu\text{A}, I_C = 0$	6		V
$I_{CBO}$	Collector-Cutoff Current	$V_{CB} = 200 \text{ V}, I_E = 0$		0.1	$\mu\text{A}$
$I_{EBO}$	Emitter-Cutoff Current	$V_{EB} = 6 \text{ V}, I_C = 0$		0.1	$\mu\text{A}$
<b>On Characteristics*</b>					
$h_{FE}$	DC Current Gain	$V_{CE} = 10 \text{ V}, I_C = 1.0 \text{ mA}$ $V_{CE} = 10 \text{ V}, I_C = 10 \text{ mA}$ $V_{CE} = 10 \text{ V}, I_C = 30 \text{ mA}$	25 40 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 On Voltage	$I_C = 20 \text{ mA}, I_B = 2.0 \text{ mA}$		0.9	V
<b>Small Signal Characteristics</b>					
$f_T$	Current Gain Bandwidth Product	$I_C = 10 \text{ mA}, V_{CE} = 20 \text{ V}, f = 100 \text{ MHz}$	50		MHz
$C_{cb}$	Collector-Base Capacitance	$V_{CB} = 20 \text{ V}, I_E = 0, f = 1.0 \text{ MHz}$		3.0	pF

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

## Typical Performance Characteristics

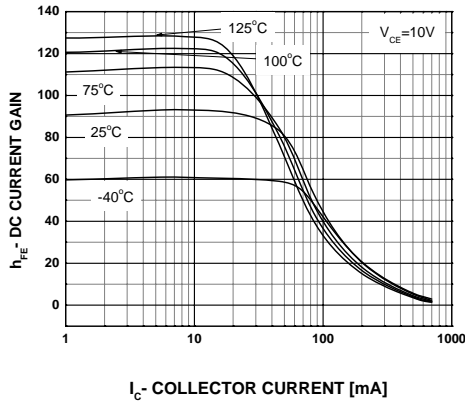


Figure 1. DC Current Gain vs Collector Current

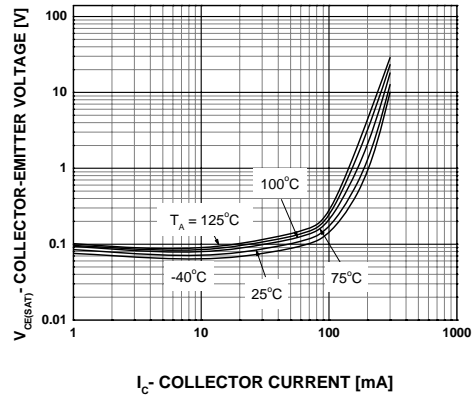


Figure 2. Collector-Emitter Saturation Voltage vs Collector Current

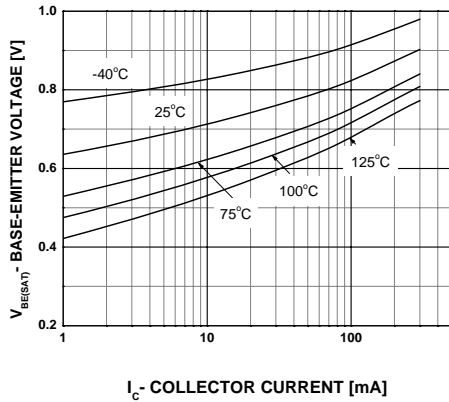


Figure 3. Base-Emitter Saturation Voltage vs Collector Current

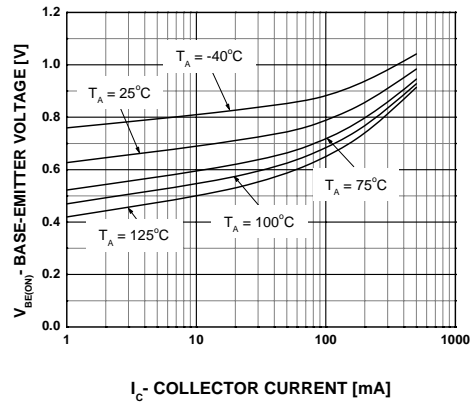


Figure 4. Base-Emitter ON Voltage vs Collector Current

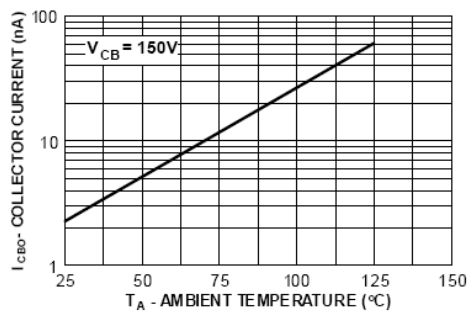


Figure 5. Collector-Cutoff Current vs Ambient Temperature

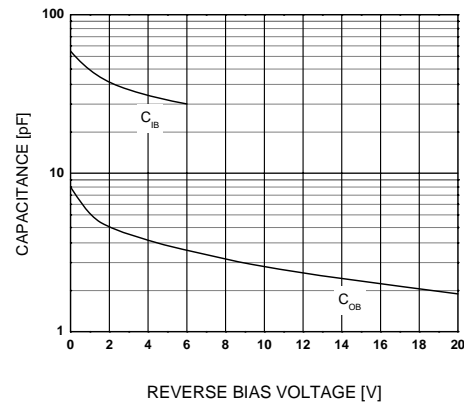


Figure 6. Collector-Base and Emitter-Base Capacitance vs Reverse Bias Voltage

### Typical Performance Characteristics (Continued)

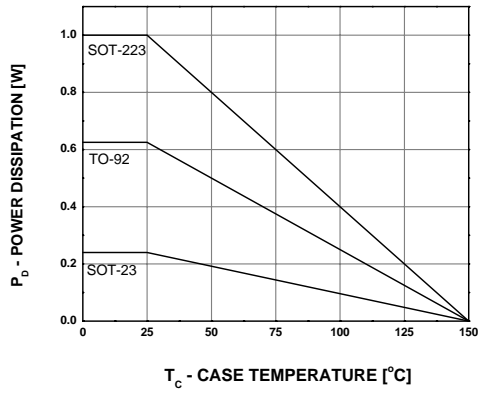







Figure 7. Power Dissipation vs Ambient Temperature



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Rev. I41