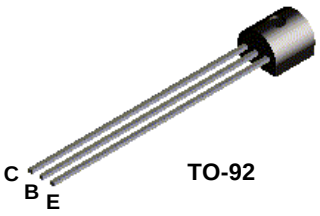
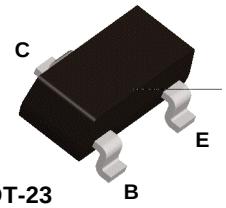
N

Discrete POWER & Signal Technologies

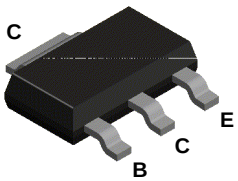
MPSA42 MMBTA42 PZTA42



TO-92



SOT-23
Mark: 1D



SOT-223

NPN High Voltage Amplifier

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*

TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{CES}	Collector-Emitter Voltage	300	V
V_{CBO}	Collector-Base Voltage	300	V
V_{EBO}	Emitter-Base Voltage	6.0	V
I_C	Collector Current - Continuous	200	mA
T_J, T_{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°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

TA = 25°C unless otherwise noted

Symbol	Characteristic	Max			Units
		MPSA42	*MMBTA42	**PZTA42	
P_D	Total Device Dissipation Derate above 25°C	625 5.0	350 2.8	1,000 8.0	mW mW/°C
$R_{\theta JC}$	Thermal Resistance, Junction to Case	83.3			°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	200	357	125	°C/W

*Device mounted on FR-4 PCB 1.6" X 1.6" X 0.06."

**Device mounted on FR-4 PCB 36 mm X 18 mm X 1.5 mm; mounting pad for the collector lead min. 6 cm^2

NPN High Voltage Amplifier
(continued)

Electrical Characteristics
TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
OFF CHARACTERISTICS					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage*	I_C = 1.0 mA, I_B = 0	300		V
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	I_C = 100 µA, I_E = 0	300		V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	I_E = 100 µA, I_C = 0	6.0		V
I_{CBO}	Collector-Cutoff Current	V_{CB} = 200 V, I_E = 0		0.1	µA
I_{EBO}	Emitter-Cutoff Current	V_{EB} = 6.0 V, I_C = 0		0.1	µA
ON CHARACTERISTICS*					
h_{FE}	DC Current Gain	I_C = 1.0 mA, V_{CE} = 10 V I_C = 10 mA, V_{CE} = 10 V I_C = 30 mA, V_{CE} = 10 V	25 40 40		
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	I_C = 20 mA, I_B = 2.0 mA		0.5	V
$V_{BE(sat)}$	Base-Emitter Saturation Voltage	I_C = 20 mA, I_B = 2.0 mA		0.9	V
SMALL SIGNAL 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

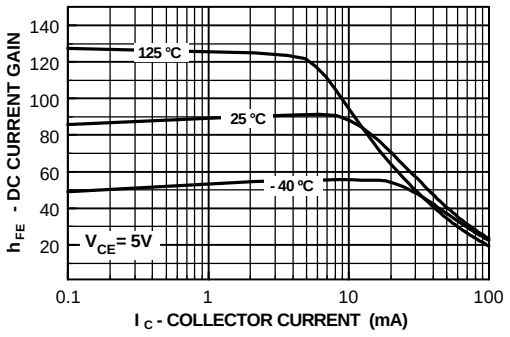
*Pulse Test: Pulse Width≤ 300 µs, Duty Cycle≤ 2.0%

Spice Model

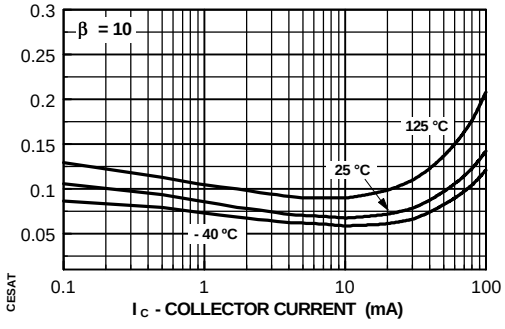
NPN (Is=34.9f Xti=3 Eg=1.11 Vaf=100 Bf=2.65K Ne=1.708 Ise=16.32p Ikf=23.79m Xtb=1.5 Br=9.769 Nc=2 Isc=0 Ikr=0 Rc=7 Cjc=14.23p Mjc=.5489 Vjc=.75 Fc=.5 Cje=49.62p Mje=.4136 Vje=.75 Tr=934.3p Tf=1.69n Itf=5 Vtf=20 Xtf=150 Rb=10)

Typical Characteristics

DC Current Gain vs Collector Current

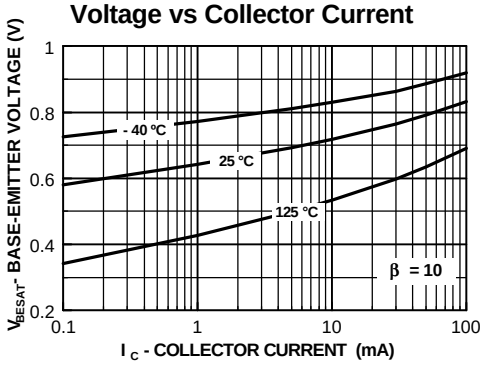


Collector-Emitter Saturation Voltage vs Collector Current

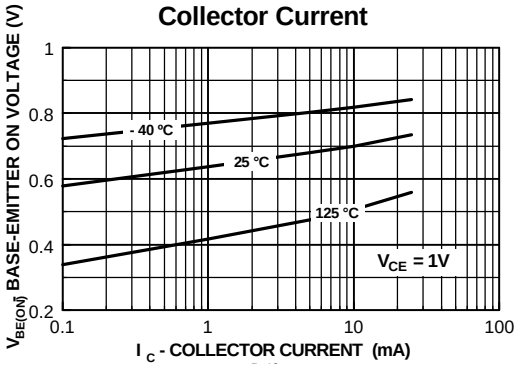


Typical Characteristics (continued)

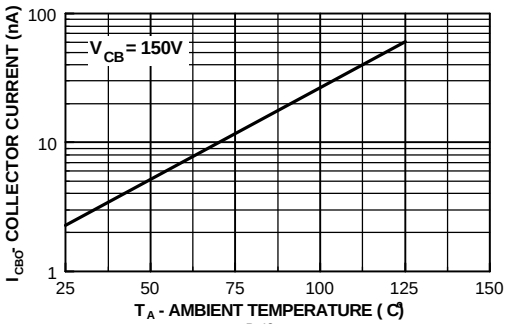
Base-Emitter Saturation Voltage vs Collector Current



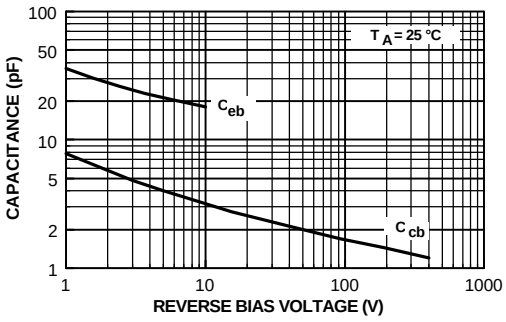
Base-Emitter ON Voltage vs Collector Current



Collector-Cutoff Current vs Ambient Temperature



Collector-Base and Emitter-Base Capacitance vs Reverse Bias Voltage



Power Dissipation vs Ambient Temperature