NPN Small-Signal Darlington Transistor

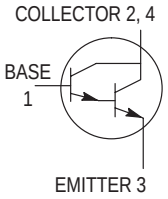
PZTA14T1

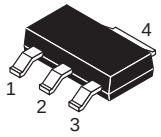
Motorola Preferred Device

SOT–223 PACKAGE
MEDIUM POWER
NPN SILICON
DARLINGTON
TRANSISTOR
SURFACE MOUNT

This NPN small signal darlington transistor is designed for use in switching applications, such as print hammer, relay, solenoid and lamp drivers. The device is housed in the SOT-223 package, which is designed for medium power surface mount applications.

- High f_T: 125 MHz Minimum
- The SOT-223 Package can be soldered using wave or reflow.
- SOT-223 package ensures level mounting, resulting in improved thermal conduction, and allows visual inspection of soldered joints. The formed leads absorb thermal stress during soldering, eliminating the possibility of damage to the die.
- Available in 12 mm Tape and Reel
  Use PZTA14T1 to order the 7 inch/1000 unit reel
  Use PZTA14T3 to order the 13 inch/4000 unit reel
- The PNP Complement is PZTA64T1





CASE 318E-04, STYLE 1
TO-261AA

MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CES}	30	Vdc
Collector-Emitter Voltage	V_{CEO}	30	Vdc
Emitter-Base Voltage	V_{EBO}	10	Vdc
Collector Current	I_C	300	mAdc
Total Power Dissipation @ T_A = 25°C(1)	P_D	1.5	Watts
Operating and Storage Temperature Range	T_J, T_{stg}	–65 to 150	°C

DEVICE MARKING

P1N

THERMAL CHARACTERISTICS

Thermal Resistance Junction-to-Ambient (surface mounted)	$R_{\theta JA}$	83.3	°C/W
Maximum Temperature for Soldering Purposes Time in Solder Bath	T_L	260 10	°C Sec

1. Device mounted on a FR-4 glass epoxy printed circuit board 1.575 in. x 1.575 in. x 0.0625 in.; mounting pad for the collector lead = 0.93 sq. in.

Preferred devices are Motorola recommended choices for future use and best overall value.

REV 1

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristics	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Base Breakdown Voltage (I_C = 100 μAdc, I_E = 0)	$V_{(BR)CBO}$	30	—	—	Vdc
Collector-Emitter Breakdown Voltage (I_C = 100 μAdc, I_B = 0)	$V_{(BR)CES}$	30	—	—	Vdc
Emitter-Base Breakdown Voltage (I_E = 10 μAdc, I_C = 0)	$V_{(BR)EBO}$	10	—	—	Vdc
Collector-Base Cutoff Current (V_{CB} = 30 Vdc, I_E = 0)	I_{CBO}	—	—	0.1	μAdc
Emitter-Base Cutoff Current (V_{EB} = 10 Vdc, I_C = 0)	I_{EBO}	—	—	0.1	μAdc
ON CHARACTERISTICS (2)					
DC Current Gain (I_C = 10 mAdc, V_{CE} = 5.0 Vdc) (I_C = 100 mAdc, V_{CE} = 5.0 Vdc)	h_{FE}	 10,000 20,000	 — —	 — —	—
Collector-Emitter Saturation Voltage (I_C = 100 mAdc, I_B = 0.1 mAdc)	$V_{CE(sat)}$	—	—	1.5	Vdc
Base-Emitter On Voltage (I_C = 100 mAdc, V_{CE} = 5.0 Vdc)	$V_{BE(on)}$	—	—	2.0	Vdc
DYNAMIC CHARACTERISTICS					
Current-Gain — Bandwidth Product (I_C = 10 mAdc, V_{CE} = 5.0 Vdc)	f_T	125	—	—	MHz

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

TYPICAL ELECTRICAL CHARACTERISTICS

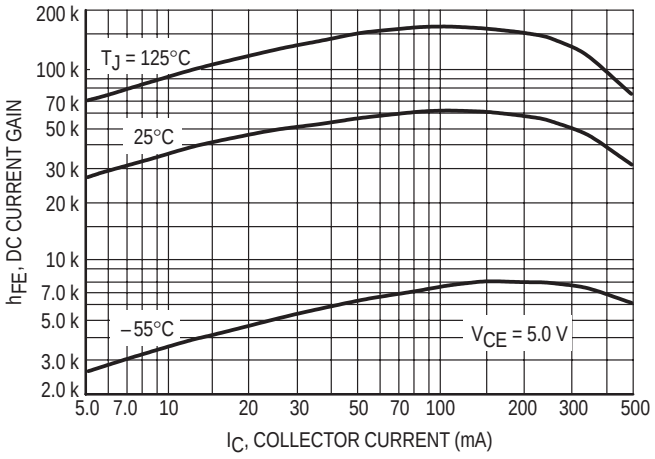


Figure 1. DC Current Gain

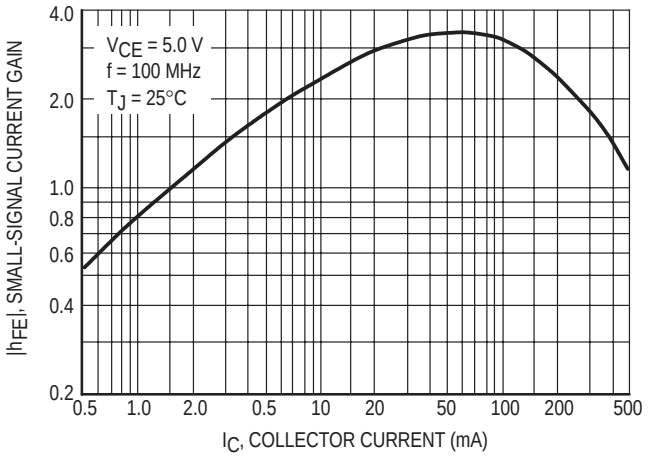


Figure 2. High Frequency Current Gain

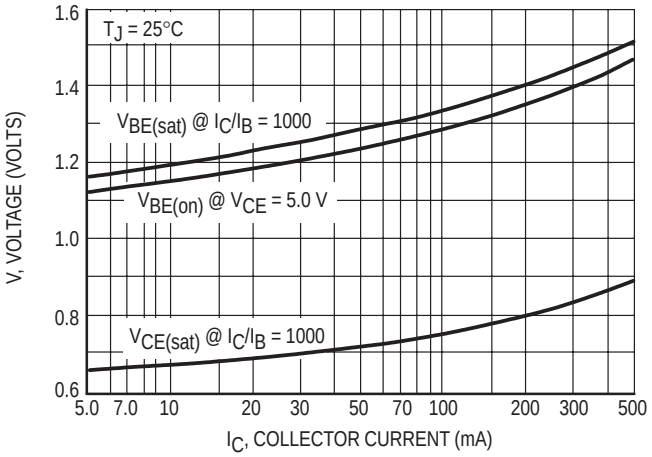


Figure 3. “On” Voltages

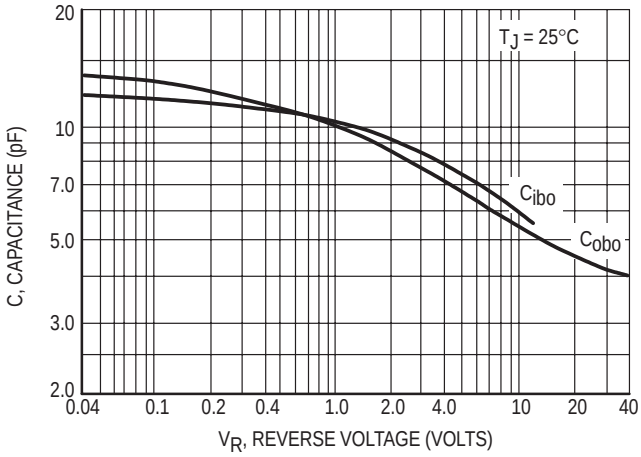


Figure 4. Capacitance

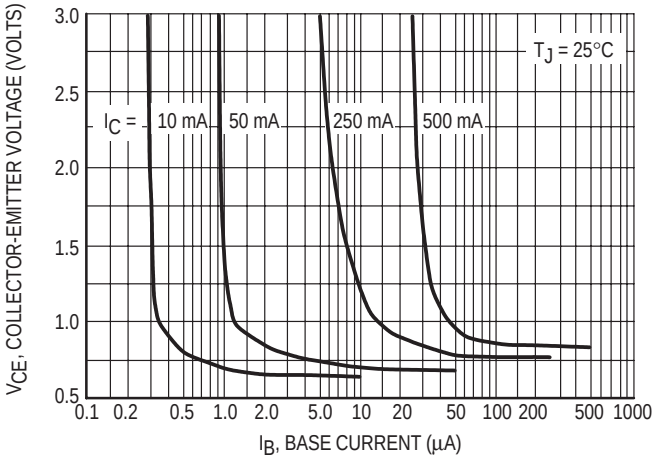


Figure 5. Collector Saturation Region

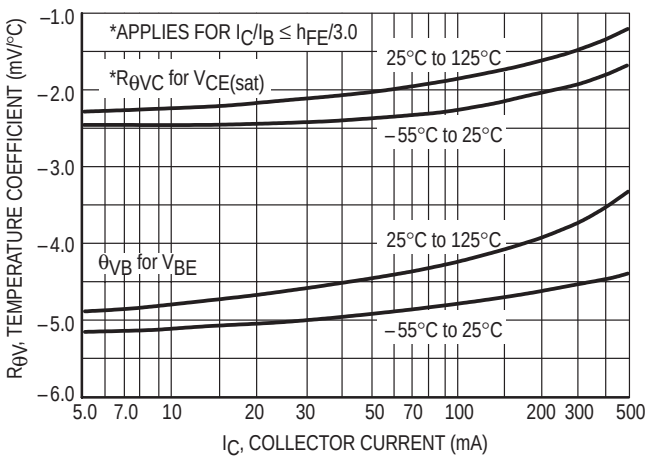


Figure 6. Temperature Coefficients