

Description

NPN switching transistor in a SOT-23 plastic package.

Feature

- High current (max. 600 mA)
- Lead finish: 100% matte Sn(Tin)
- Mounting position: Any
- Qualified max reflow temperature: 260°C
- Device meets MSL 1 requirements
- Pure tin plating: 7 ~ 17 μm
- Pin flatness: ≤ 3mil

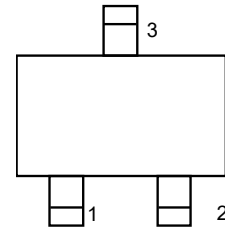
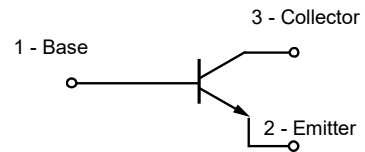


Fig.1 Simplified outline and symbol.
PT23T2222A/SOT-23

Applications

- Switching and linear amplification.

Maximum Ratings and Thermal Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Collector-base voltage	V _{CB0}	open emitter	75	-	-	V
Collector-emitter voltage	V _{CEO}	open base	40	-	-	V
Emitter-base voltage	V _{EB0}	open collector	6	-	-	V
Collector current (DC)	I _C		-	-	600	mA
Peak collector current	I _{CM}		-	-	800	mA
Peak base current	I _{BM}		-	-	200	mA
Total power dissipation	P _{tot}	T _{amb} ≤ 25 °C; note 1	-	-	250	mW
Storage temperature	T _{stg}		-65	-	+150	°C
Junction temperature	T _j		-	-	150	°C
Operating ambient temperature	T _{amb}		-65	-	+150	°C

Note:

1. Transistor mounted on an FR4 printed-circuit board.

Thermal Characteristics

Parameter	Symbol	Conditions	Value	Units
Thermal resistance from junction to ambient	$R_{th\ j-a}$	note 1	500	K/W

Note:

1. Transistor mounted on an FR4 printed-circuit board.

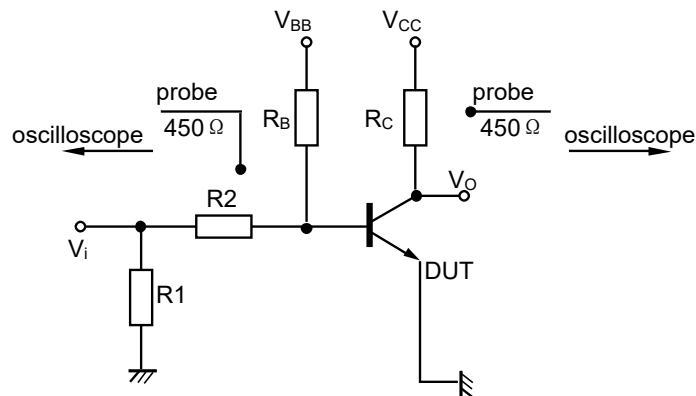
Electrical characteristics per line@(unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Max.	Units
Collector cut-off current	I_{CBO}	$I_E = 0; V_{CB} = 60\text{ V}$	-	30	nA
		$I_E = 0; V_{CB} = 60\text{ V}; T_j = 125\text{ }^\circ\text{C}$	-	30	nA
Emitter cut-off current	I_{EBO}	$I_C = 0; V_{EB} = 5\text{ V}$	-	10	nA
DC current gain	h_{FE}	$I_C = 0.1\text{ mA}; V_{CE} = 10\text{ V}$	35	-	
		$I_C = 1\text{ mA}; V_{CE} = 10\text{ V}$	50	-	
		$I_C = 10\text{ mA}; V_{CE} = 10\text{ V}$	75	-	
		$I_C = 10\text{ mA}; V_{CE} = 10\text{ V}; T_{amb} = -55\text{ }^\circ\text{C}$	35	-	
		$I_C = 150\text{ mA}; V_{CE} = 10\text{ V}$	100	300	
		$I_C = 150\text{ mA}; V_{CE} = 1\text{ V}$	50	-	
Collector-emitter saturation voltage	$V_{CE\ sat}$	$I_C = 150\text{ mA}; I_B = 15\text{ mA}; \text{note 1}$	-	300	mV
		$I_C = 500\text{ mA}; I_B = 50\text{ mA}; \text{note 1}$	-	1	V
Base-emitter saturation voltage	$V_{BE\ sat}$	$I_C = 150\text{ mA}; I_B = 15\text{ mA}; \text{note 1}$	0.6	1.2	V
		$I_C = 500\text{ mA}; I_B = 50\text{ mA}; \text{note 1}$	-	2	V
Collector capacitance	C_C	$I_E = I_E = 0; V_{CB} = 10\text{ V}; f = 1\text{ MHz}$	-	8	pF
Emitter capacitance	C_e	$I_C = I_C = 0; V_{EB} = 500\text{ mV}; f = 1\text{ MHz}$	-	25	
Transition frequency	f_T	$I_C = 20\text{ mA}; V_{CE} = 20\text{ V}; f = 100\text{ MHz}$	300	-	MHZ
Noise figure	F	$I_C = 100\text{ mA}; V_{CE} = 5\text{ V}; R_s = 1\text{ kW}; f = 1\text{ kHz}$	-	4	dB

Parameter	Symbol	Conditions	Min.	Max.	Units
Switching times (between 10% and 90% levels); (see Fig.2)					
Turn-on time	T_{on}	$I_{Con} = 150 \text{ mA}; I_{Bon} = 15 \text{ mA};$ $I_{Boff} = -15 \text{ mA}$	-	35	ns
Delay time	T_d		-	15	ns
Rise time	T_r		-	20	ns
Turn-off time	T_{off}		-	250	ns
Storage time	T_s		-	200	ns
Fall time	T_f		-	60	ns

Note:

1. Pulse test: $t_p \leq 300 \text{ ms}; d \leq 0.02$.



$V_i = 9.5 \text{ V}; T = 500 \text{ ms}; t_p = 10 \text{ ms}; t_r = t_f \leq 3 \text{ ns}$.

$R_1 = 68 \text{ W}; R_2 = 325 \text{ W}; R_B = 325 \text{ W}; R_C = 160 \text{ W}$.

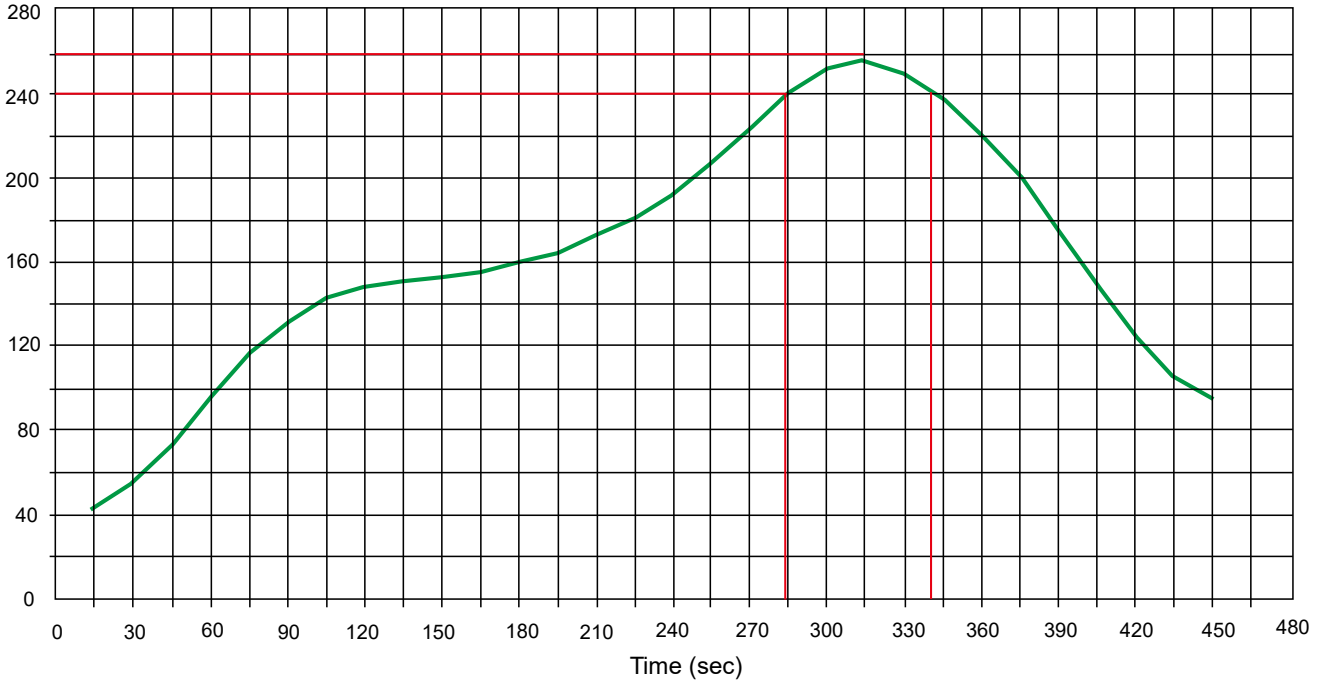
$V_{BB} = -3.5 \text{ V}; V_{CC} = 29.5 \text{ V}$.

Oscilloscope: input impedance $Z_i = 50 \text{ W}$.

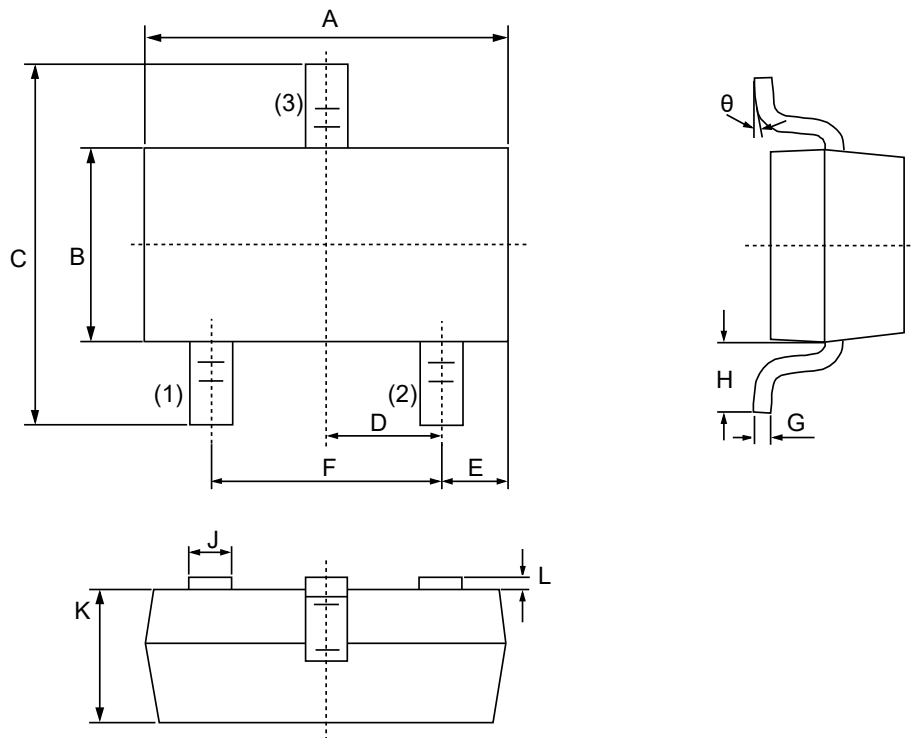
Fig.2 Test circuit for switching times.

Solder Reflow Recommendation

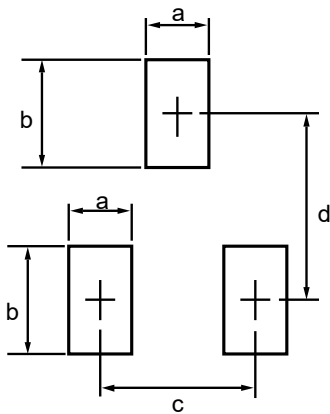
Peak Temp=257°C, Ramp Rate=0.802deg. °C/sec



Product dimension(SOT-23)

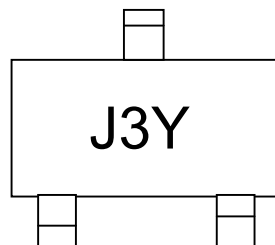


Dim	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	2.80	3.00	0.1102	0.1197
B	1.20	1.40	0.0472	0.0551
C	2.10	2.50	0.0830	0.0984
D	0.89	1.02	0.0350	0.0401
E	0.45	0.60	0.0177	0.0236
F	1.78	2.04	0.0701	0.0807
G	0.085	0.177	0.0034	0.0070
H	0.45	0.60	0.0180	0.0236
J	0.37	0.50	0.0150	0.0200
K	0.89	1.11	0.0350	0.0440
L	0.013	0.100	0.0005	0.0040
θ	0°	10°	0°	10°



Dim	Millimeters	
	MIN	MAX
a	--	0.7
b	--	1.2
c	--	2.04
d	--	2.2


Marking information



Ordering information

Device	Package	Reel	Shipping
PT23T2222A	SOT-23 (Pb-Free)	7"	3000 / Tape & Reel

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