

ZXTN25060BZ 60V, SOT89, NPN medium power transistor

Summary

 $BV_{CEX} > 150V$

 $BV_{CEO} > 60V$

 $BV_{ECO} > 6V$

 $I_{C(cont)} = 5A$

V_{CE(sat)} < 70mV @ 1A

 $R_{CE(sat)} = 48m\Omega$

 $P_D = 2.4W$



Packaged in the SOT89 outline this new low saturation 60V NPN transistor offers extremely low on state losses making it ideal for use in DC-DC circuits and various driving and power management functions.

Features

- Extremely low equivalent on resistance; $R_{CE(sat)} = 46m\Omega$ at 5A
- · 5 amps continuous current
- · Up to 10 amps peak current
- · Very low saturation voltages
- Excellent h_{FE} characteristics
- · 6V reverse blocking capability

Applications

- · Emergency lighting circuits
- Motor driving (including DC fans)
- · Solenoid, relay and actuator drivers
- DC-DC modules
- Backlight inverters
- · Power switches
- · MOSFET gate drivers

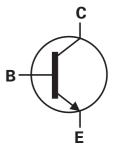
Ordering information

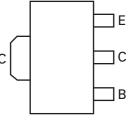
Device	Reel Size (inches)	Tape width (mm)	Quantity per reel
ZXTN25060BZTA	7	12	1000

Device marking

1C7







Pinout - top view

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V _{CBO}	150	V
Collector-emitter voltage (forward blocking)	V _{CEX}	150	V
Collector-emitter voltage	V _{CEO}	60	V
Emitter-collector voltage (reverse blocking)	V _{ECO}	6	V
Emitter-base voltage	V _{EBO}	7	V
Continuous collector current ^(c)	I _C	5	Α
Base current	I _B	1	Α
Peak pulse current	I _{CM}	10	Α
Power dissipation at T _{amb} = 25°C ^(a)	P _D	1.1	W
Linear derating factor		8.8	mW/°C
Power dissipation at T _{amb} = 25°C ^(b)	P _D	1.8	W
Linear derating factor		14.4	mW/°C
Power dissipation at T _{amb} = 25°C ^(c)	P _D	2.4	W
Linear derating factor		19.2	mW/°C
Power dissipation at T _{amb} = 25°C ^(d)	P _D	4.46	W
Linear derating factor		35.7	mW/°C
Operating and storage temperature range	T _j , T _{stg}	- 55 to 150	°C

Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient ^(a)	$R_{\Theta JA}$	117	°C/W
Junction to ambient ^(b)	$R_{\Theta JA}$	68	°C/W
Junction to ambient ^(c)	$R_{\Theta JA}$	51	°C/W
Junction to ambient ^(d)	$R_{\Theta JA}$	28	°C/W

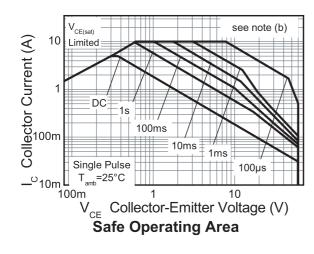
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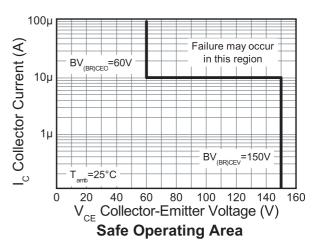
⁽a) For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

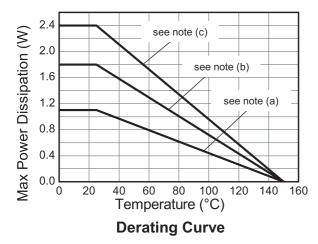
⁽b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions. (c) Mounted on 50mm x 50mm x 1.6mm FR4 PCB with a high coverage of single sided 2 oz copper in still air conditions. (d) As (c) above measured at t<5secs.

ZXTN25060BZ

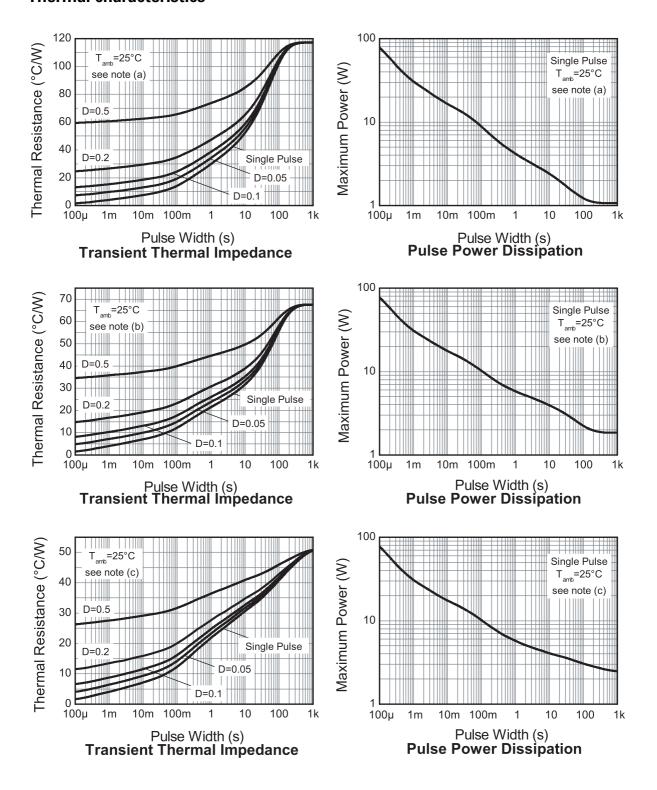
Thermal characteristics







Thermal characteristics



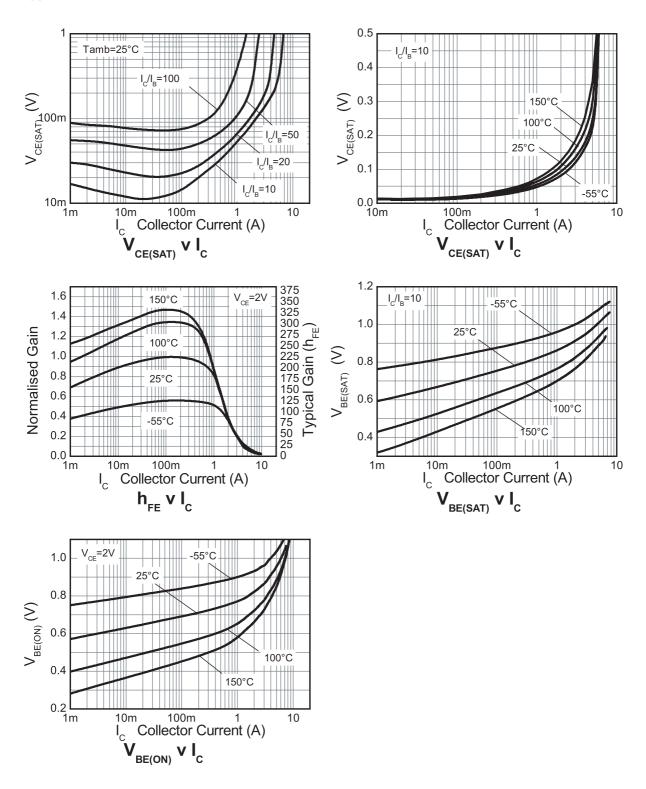
Electrical characteristics (at T_{amb} = 25°C unless otherwise stated)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV _{CBO}	150	190		V	$I_C = 100 \mu A$
Collector-emitter breakdown voltage (forward blocking)	BV _{CEX}	150	190			I_C = 100 μ A, $R_{BE} \le 1k\Omega$ or $-1V < V_{BE} < 0.25V$
Collector-emitter breakdown voltage (base open)	BV _{CEO}	60	80		V	I _C = 10mA (*)
Emitter-base breakdown voltage	BV _{EBO}	7	8		V	I _E = 100μA
Emitter-collector breakdown voltage (reverse blocking)	BV _{ECX}	6	8		V	I_E = 100μA, $R_{BC} \le 1k\Omega$ or 0.25V > V_{BC} > -0.25V
Emitter-collector breakdown voltage (base open)	BV _{ECO}	6	7		V	$I_E = 100 \mu A$,
Collector-base cut-off current	I _{CBO}		<1	50 20	nA μA	$V_{CB} = 120V$ $V_{CB} = 120V$, $T_{amb} = 100^{\circ}C$
Collector-emitter cut-off current	I _{CEX}		-	100	nA	V_{CE} = 120V; $R_{BE} \le 1k\Omega$ or $-1V < V_{BE} < 0.25V$
Emitter-base cut-off current	I _{EBO}		<1	50	nA	V _{EB} = 5.6V
Collector-emitter saturation	V _{CE(sat)}		55	70	mV	$I_C = 1A$, $I_B = 100 \text{mA}^{(*)}$
voltage			70	90	mV	$I_C = 1A, I_B = 50 \text{mA}^{(*)}$
			185	230	mV	$I_C = 4A$, $I_B = 400 \text{mA}^{(*)}$
			240	305	mV	$I_C = 5A$, $I_B = 500 \text{mA}^{(*)}$
Base-emitter saturation voltage	V _{BE(sat)}		1020	1100	mV	$I_C = 5A$, $I_B = 500 \text{mA}^{(*)}$
Base-emitter turn-on voltage	V _{BE(on)}		960	1050	mV	$I_C = 5A$, $V_{CE} = 2V^{(*)}$
Static forward current transfer	h _{FE}	100	200	300		$I_C = 10 \text{mA}, V_{CE} = 2V^{(*)}$
ratio		90	180			$I_C = 1A, V_{CE} = 2V^{(*)}$
		45	90			$I_C = 2A$, $V_{CE} = 2V^{(*)}$
			20			$I_C = 5A$, $V_{CE} = 2V^{(*)}$
Transition frequency	f _T		185		MHz	I _C = 100mA, V _{CE} = 5V f = 100MHz
Output capacitance	C _{OBO}		11.5	20	pF	V _{CB} = 10V, f = 1MHz ^(*)
Delay time	t _d		16		ns	$V_{CC} = 10V. I_C = 500mA,$
Rise time	t _r		15		ns	$I_{B1} = I_{B2} = 50 \text{mA}.$
Storage time	t _s		509		ns	
Fall time	t _f		57		ns	

NOTES:

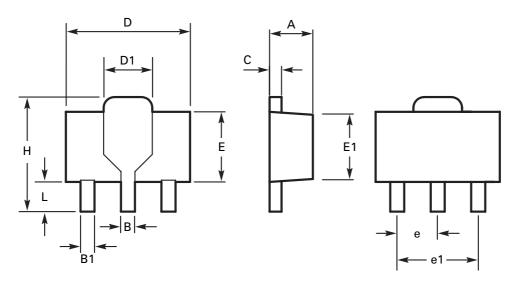
(*) Measured under pulsed conditions. Pulse width ${\leq}300\mu s;$ duty cycle ${\leq}2\%.$

Typical characteristics



ZXTN25060BZ

Package outline - SOT89



DIM	Millin	neters	Inc	hes	DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
Α	1.40	1.60	0.550	0.630	E1	2.13	2.29	0.084	0.090
В	0.44	0.56	0.017	0.022	е	1.50 BSC		0.059 BSC	
B1	0.36	0.48	0.014	0.019	e1	3.00 BSC		0.118 BSC	
С	0.35	0.44	0.014	0.019	Н	3.94	4.25	0.155	0.167
D	4.40	4.60	0.173	0.181	L	0.89	1.20	0.155	0.167
E	2.29	2.60	0.090	0.102		-	-	-	-

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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