

ZXTN2010Z

60V NPN LOW SATURATION MEDIUM POWER TRANSISTOR IN SOT89

SUMMARY

$BV_{CEO} = 60V$; $R_{SAT} = 30m\Omega$; $I_C = 5A$

DESCRIPTION

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.



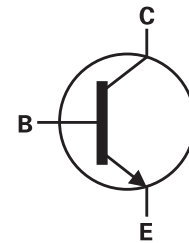
SOT89

FEATURES

- Extremely low equivalent on-resistance; $R_{SAT} = 30mV$ at 6A
- 5 amps continuous current
- Up to 20 amps peak current
- Very low saturation voltages
- Excellent h_{FE} characteristics up to 10 amps

APPLICATIONS

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



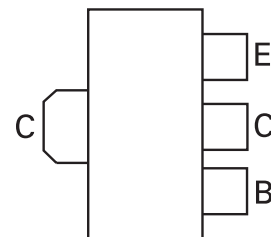
ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXTN2010ZTA	7"	12mm embossed	1,000 units

DEVICE MARKING

851

PINOUT



TOP VIEW

ZXTN2010Z

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Collector-base voltage	BV_{CBO}	150	V
Collector-emitter voltage	BV_{CEO}	60	V
Emitter-base voltage	BV_{EBO}	7	V
Continuous collector current ^(a)	I_C	5	A
Peak pulse current	I_{CM}	20	A
Power dissipation at $T_A = 25^\circ\text{C}$ ^(a)	P_D	1.5	W
Linear derating factor		12	mW/ $^\circ\text{C}$
Power dissipation at $T_A = 25^\circ\text{C}$ ^(b)	P_D	2.1	W
Linear derating factor		16.8	mW/ $^\circ\text{C}$
Operating and storage temperature range	T_j, T_{stg}	-55 to +150	$^\circ\text{C}$

THERMAL RESISTANCE

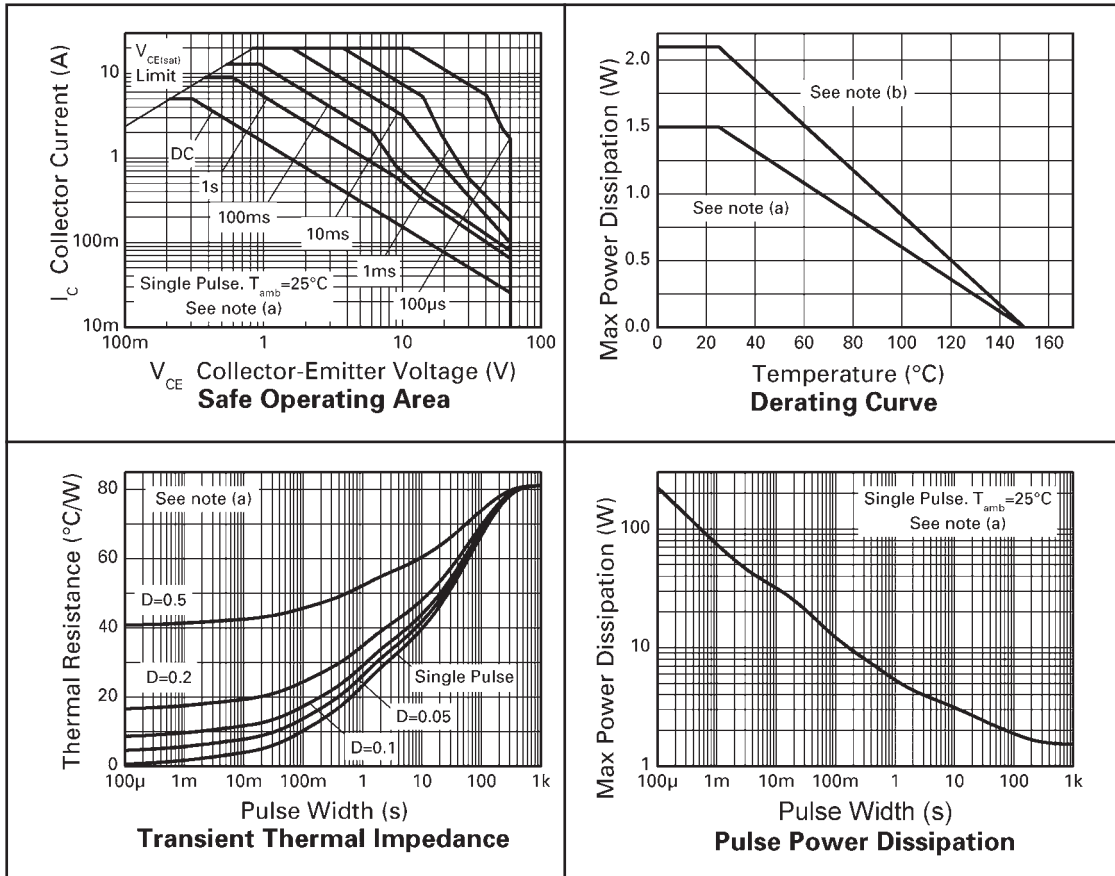
PARAMETER	SYMBOL	VALUE	UNIT
Junction to ambient ^(a)	$R_{\theta JA}$	83	$^\circ\text{C}/\text{W}$
Junction to ambient ^(b)	$R_{\theta JA}$	60	$^\circ\text{C}/\text{W}$

NOTES

- (a) For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
(b) For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

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CHARACTERISTICS



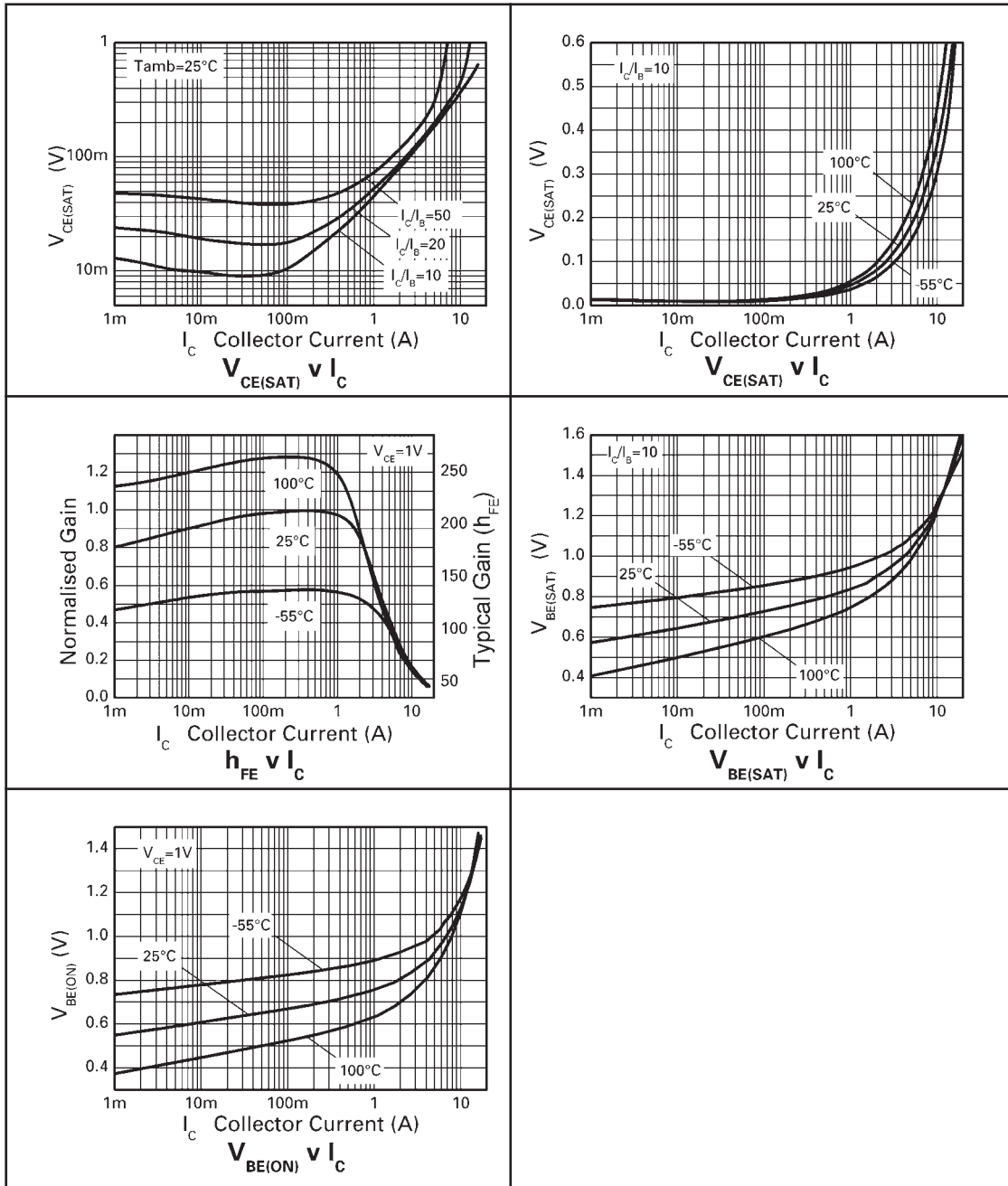
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ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Collector-base breakdown voltage	BV_{CBO}	150	190		V	$I_C = 100\mu\text{A}$
Collector-emitter breakdown voltage	BV_{CER}	150	190		V	$I_C = 1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$
Collector-emitter breakdown voltage	BV_{CEO}	60	80		V	$I_C = 10\text{mA}^*$
Emitter-base breakdown voltage	BV_{EBO}	7	8.1		V	$I_E = 100\mu\text{A}$
Collector cut-off current	I_{CBO}			20 0.5	nA μA	$V_{CB} = 120\text{V}$ $V_{CB} = 120\text{V}, T_{amb} = 100^{\circ}\text{C}$
Collector cut-off current	I_{CER} $R \leq 1\text{k}\Omega$			20 0.5	nA μA	$V_{CB} = 120\text{V}$ $V_{CB} = 120\text{V}, T_{amb} = 100^{\circ}\text{C}$
Emitter cut-off current	I_{EBO}			10	nA	$V_{EB} = 6\text{V}$
Collector-emitter saturation voltage	$V_{CE(SAT)}$		17 35 40 90 170	30 55 65 125 230	mV	$I_C = 100\text{mA}$, $I_B = 5\text{mA}^*$ $I_C = 1\text{A}$, $I_B = 100\text{mA}^*$ $I_C = 1\text{A}$, $I_B = 50\text{mA}^*$ $I_C = 2\text{A}$, $I_B = 50\text{mA}^*$ $I_C = 6\text{A}$, $I_B = 300\text{mA}^*$
Base-emitter saturation voltage	$V_{BE(SAT)}$		970	1100	mV	$I_C = 6\text{A}$, $I_B = 300\text{mA}^*$
Base-emitter turn-on voltage	$V_{BE(ON)}$		910	1050	mV	$I_C = 6\text{A}$, $V_{CE} = 1\text{V}^*$
Static forward current transfer ratio	H_{FE}	100 100 55 20	200 200 105 40	300		$I_C = 10\text{mA}$, $V_{CE} = 1\text{V}^*$ $I_C = 2\text{A}$, $V_{CE} = 1\text{V}^*$ $I_C = 5\text{A}$, $V_{CE} = 1\text{V}^*$ $I_C = 10\text{A}$, $V_{CE} = 1\text{V}^*$
Transition frequency	f_T		130			$I_C = 100\text{mA}$, $V_{CE} = 10\text{V}$ $f = 50\text{MHz}$
Output capacitance	C_{OBO}		31		pF	$V_{CB} = 10\text{V}$, $f = 1\text{MHz}^*$
Switching times	t_{ON} t_{OFF}		42 760		ns	$I_C = 1\text{A}$, $V_{CC} = 10\text{V}$, $I_{B1} = I_{B2} = 100\text{mA}$

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

TYPICAL CHARACTERISTICS

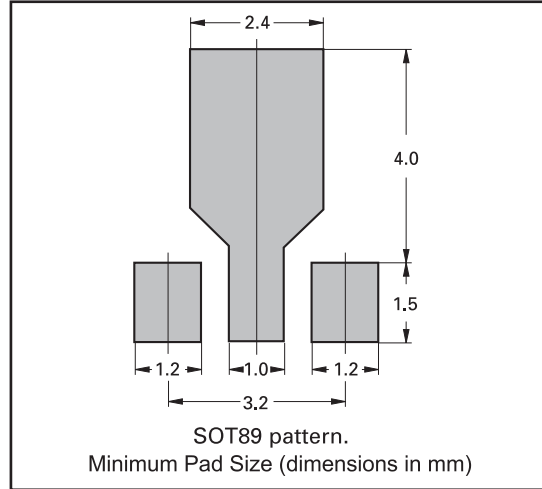


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PACKAGE OUTLINE



PAD LAYOUT DETAILS



Controlling dimensions are in millimeters. Approximate conversions are given in inches

PACKAGE DIMENSIONS

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	1.40	1.60	0.550	0.630	e	1.40	1.50	0.055	0.059
b	0.38	0.48	0.015	0.019	E	3.75	4.25	0.150	0.167
b1	-	0.53	-	0.021	E1	-	2.60	-	0.102
b2	1.50	1.80	0.060	0.071	G	2.90	3.00	0.114	0.118
c	0.28	0.44	0.011	0.017	H	2.60	2.85	0.102	0.112
D	4.40	4.60	0.173	0.181	-	-	-	-	-

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