ZXTP2009Z

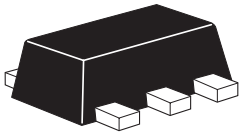
40V PNP HIGH GAIN LOW SATURATION MEDIUM POWER TRANSISTOR IN SOT89

SUMMARY

BV_{CEO} = -40V : R_{SAT} = 29mΩ; I_C = -5.5A

DESCRIPTION

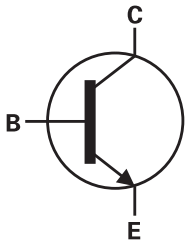
Packaged in the SOT89 outline this new low saturation 40V PNP transistor offers low on state losses making it ideal for use in DC-DC circuits, line switching and various driving and power management functions.



SOT89

FEATURES

- Extremely low equivalent on-resistance
- 5.5 amps continuous current
- Up to 15 amps peak current
- Very low saturation voltages **< -60mV @ -1**A



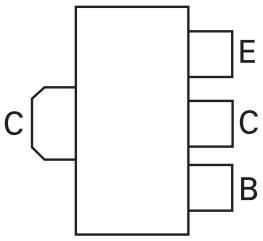
APPLICATIONS

- DC - DC converters
- MOSFET gate drivers
- Charging circuits
- Power switches
- Motor control

ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXTP2009ZTA	7”	12mm	1,000 units

PINOUT



TOP VIEW

DEVICE MARKING

53Z

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Collector-base voltage	BV_{CBO}	-50	V
Collector-base voltage	BV_{CBS}	-50	V
Collector-emitter voltage	BV_{CEO}	-40	V
Emitter-base voltage	BV_{EBO}	-7.5	V
Continuous collector current (b)	I_C	-5.5	A
Peak pulse current	I_{CM}	-15	A
Power dissipation at T_A =25°C (a)	P_D	0.9	W
Linear derating factor		7.2	mW/°C
Power dissipation at T_A =25°C (b)	P_D	1.5	W
Linear derating factor		12	mW/°C
Power dissipation at T_A =25°C (c)	P_D	2.1	W
Linear derating factor		16.8	mW/°C
Power dissipation at T_A =25°C (d)	P_D	3	W
Linear derating factor		24	mW/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to 150	°C

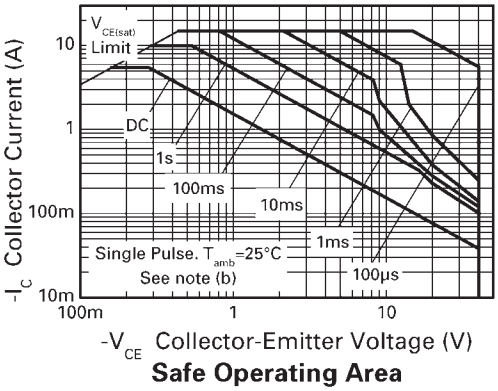
THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to ambient (a)	$R_{\Theta JA}$	139	°C/W
Junction to ambient (b)	$R_{\Theta JA}$	83	°C/W
Junction to ambient (c)	$R_{\Theta JA}$	60	°C/W
Junction to ambient (d)	$R_{\Theta JA}$	42	°C/W

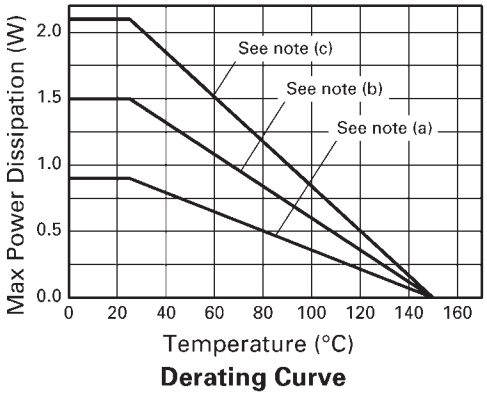
NOTES

(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) 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.
(c) 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.
(d) For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB measured at t< 5 secs.

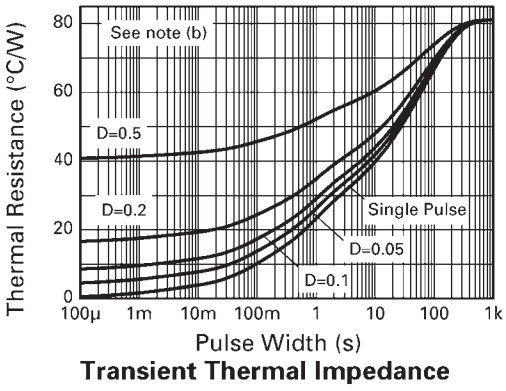
CHARACTERISTICS



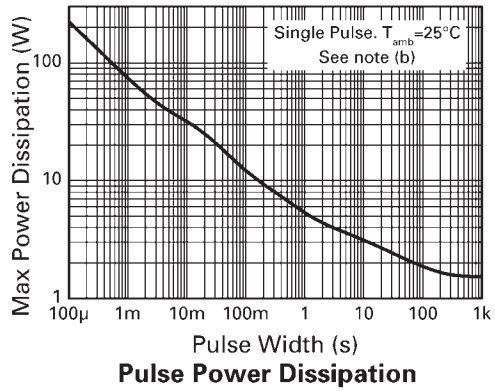
Safe Operating Area



Derating Curve



Transient Thermal Impedance



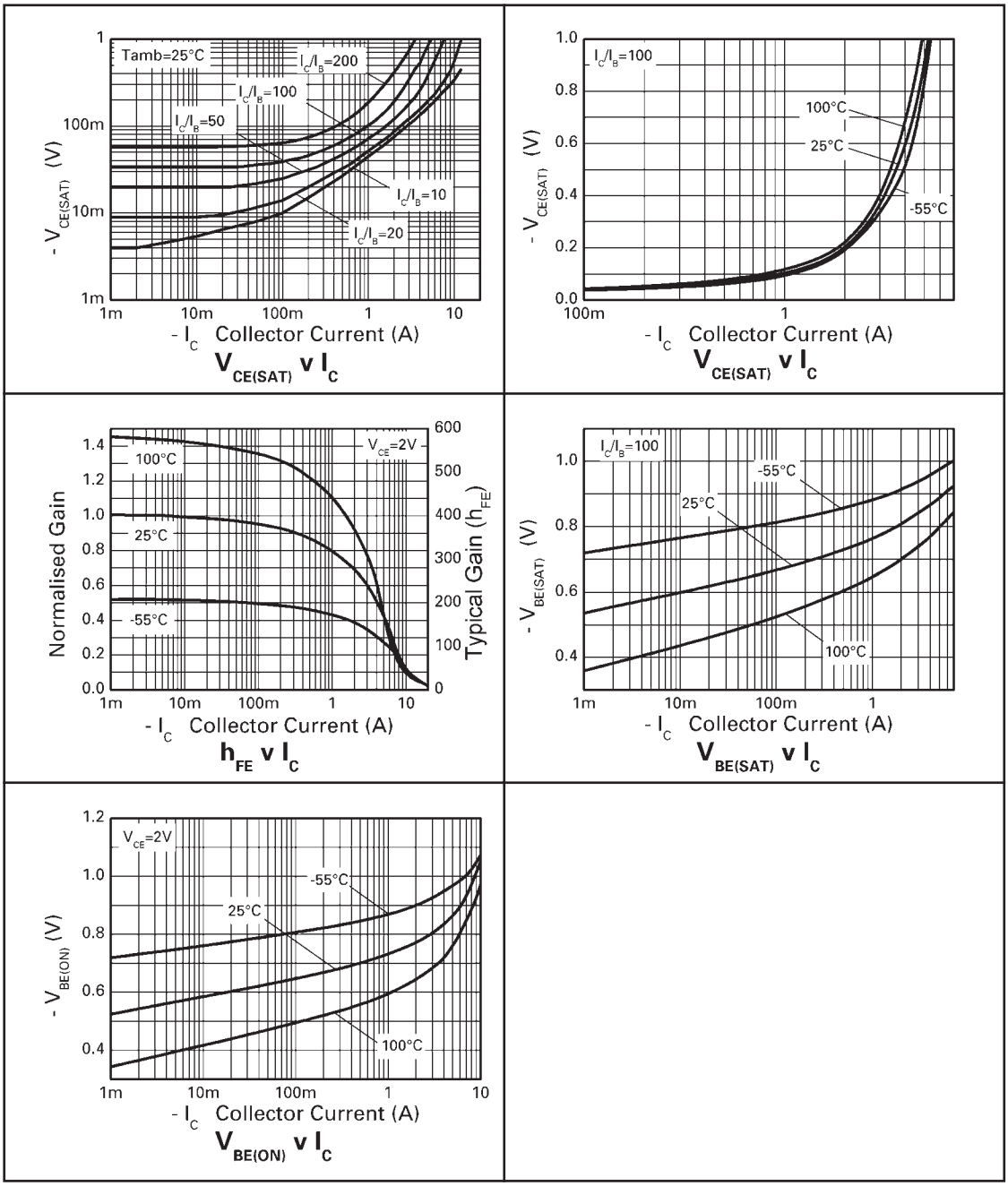
Pulse Power Dissipation

ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Collector-base breakdown voltage	BV_{CBO}	-50	-90		V	I_C=-100μA
Collector-emitter breakdown voltage	BV_{CES}	-50	-90		V	I_C=-100μA
Collector-emitter breakdown voltage	BV_{CEO}	-40	-58		V	I_C=-10mA*
Emitter-base breakdown voltage	BV_{EBO}	-7.5	-8.3		V	I_E=-100μA
Collector cut-off current	I_{CBO}		<1	-20	nA	V_{CB}=-40V
Collector cut-off current	I_{CES}		<1	-20	nA	V_{CB}=-32V
Emitter cut-off current	I_{EBO}		<1	-20	nA	V_{EB}=-6V
Collector-emitter saturation voltage	$V_{CE(SAT)}$		-15	-30	mV	I_C=-0.1A, I_B=-10mA*
			-44	-60	mV	I_C=-1A, I_B=-100mA*
			-50	-70	mV	I_C=-1A, I_B=-50mA*
			-120	-165	mV	I_C=-1A, I_B=-10mA*
			-70	-80	mV	I_C=-2A, I_B=-200mA*
			-125	-175	mV	I_C=-2A, I_B=-40mA*
			-130	-175	mV	I_C=-3.5A, I_B=-175mA*
			-162	-185	mV	I_C=-5.5A, I_B=-550mA*
Base-emitter saturation voltage	$V_{BE(SAT)}$		-820	-900	mV	I_C=-2A, I_B=-40mA*
			-1000	-1075	mV	I_C=-5.5A, I_B=-550mA*
Base-emitter turn-on voltage	$V_{BE(ON)}$		-778	-850	mV	I_C=-2A, V_{CE}=-2V*
			-869	-950	mV	I_C=-5.5A, V_{CE}=-2V*
Static forward current transfer ratio	H_{FE}	200	390			I_C=-10mA, V_{CE}=-2V*
		200	350	550		I_C=-0.5A, V_{CE}=-2V*
		170	290			I_C=-2A, V_{CE}=-2V*
		110	175			I_C=-5.5A, V_{CE}=-2V*
Transition frequency	f_T		152		MHz	I_C=-50mA, V_{CE}=-10V f=100MHz
Output capacitance	C_{OBO}		53		pF	V_{CB}=-10V, f=1MHz*
Switching times	t_d		18		ns	I_C=-1A, V_{CC}=-10V,
	t_r		17			I_{B1}=I_{B2}=-100mA
	t_s		325			
	t_r		60			
Switching times	t_d		55		ns	I_C=-2A, V_{CC}=-30V,
	t_r		107			I_{B1}=I_{B2}=-20mA
	t_s		264			
	t_r		103			

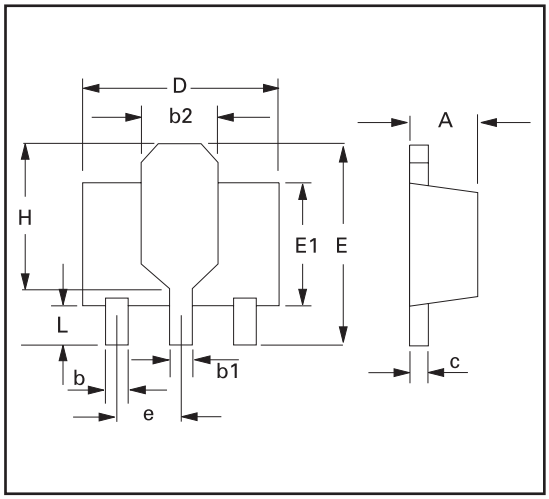
* Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤2%.

TYPICAL CHARACTERISTICS

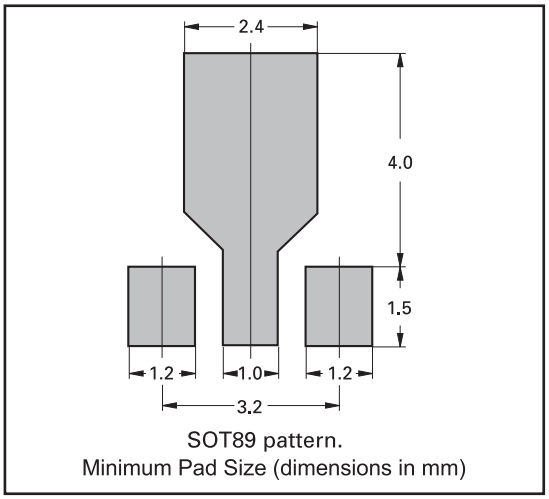


ZXTP2009Z

PACKAGE OUTLINE



PAD LAYOUT DETAILS



SOT89 pattern.
Minimum Pad Size (dimensions in mm)

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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