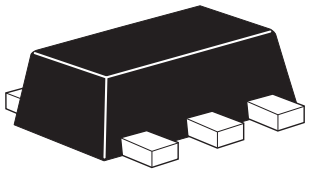
ZXTP25040DZ
40V PNP medium power transistor in SOT89

Summary



BV_{CEO} > -40V

BV_{ECO} > -3V

$I_{C(cont)}$ = -3.5A

$R_{CE(sat)}$ = 55mΩ

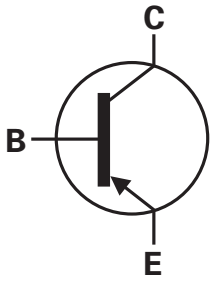
$V_{CE(sat)}$ < -90mV @ 1A

P_D = 2.4W

Complementary part number ZXTN25040DZ

Description

Advanced process capability and package design have been used to maximize the power handling and performance of this small outline transistor. The compact size and ratings of this device make it ideally suited to applications where space is at a premium.

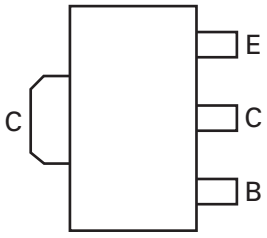


Features

- High power dissipation SOT89 package
- High peak current
- Low saturation voltage
- 3V reverse blocking voltage

Applications

- MOSFET and IGBT gate driving
- DC - DC converters
- Motor drive
- High side driver



Pinout - top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP25040DZTA	7	12	1000

Device marking

- 1L6

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-Base voltage	V_{CBO}	-45	V
Collector-Emitter voltage (forward blocking)	V_{CEO}	-40	V
Emitter-Collector voltage (reverse blocking)	V_{ECO}	-3	V
Emitter-Base voltage	V_{EBO}	-7	V
Continuous Collector current[c]	I_C	-3	A
Base current	I_B	-1	A
Peak pulse current	I_{CM}	-9	A
Power dissipation at T_A =25°C[a] Linear derating factor	P_D	1.1 8.8	W mW/°C
Power dissipation at T_A =25°C[b] Linear derating factor	P_D	1.8 14.4	W mW/°C
Power dissipation at T_A =25°C[c] Linear derating factor	P_D	2.4 19.2	W mW/°C
Power dissipation at T_A =25°C[d] Linear derating factor	P_D	4.46 35.7	W mW/°C
Power dissipation at T_C =25°C[e] Linear derating factor	P_D	15.7 126	W 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
Junction to case[e]	$R_{\Theta JC}$	7.95	°C/W

NOTES:

(a) For a device surface mounted on 15mm x 15mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

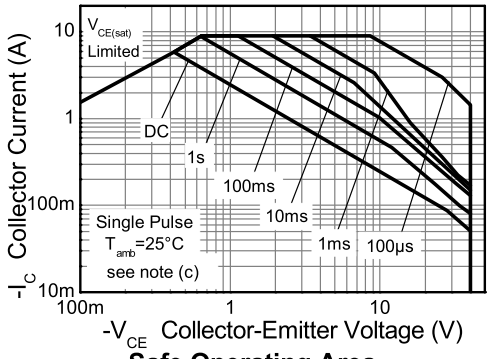
(b) Mounted on 25mm x 25mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

(c) Mounted on 50mm x 50mm x 0.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions.

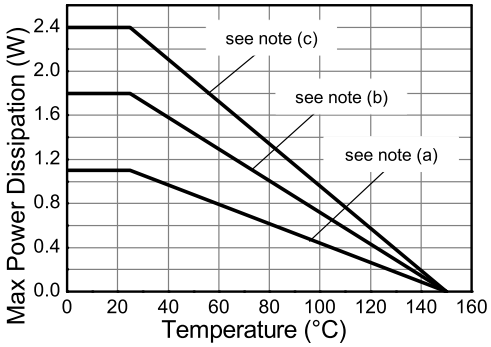
(d) As (c) above measured at t<5 seconds.

(e) Junction to case (collector tab). Typical

Thermal characteristics

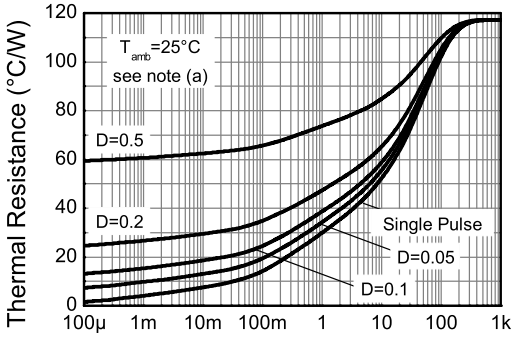


Safe Operating Area

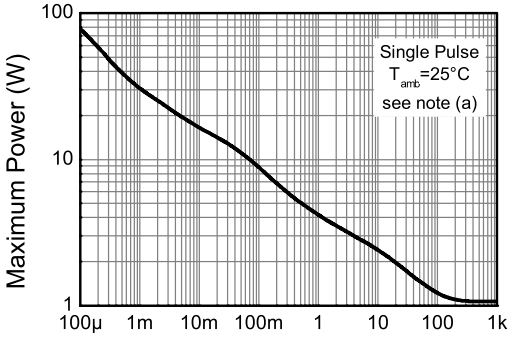


Derating Curve

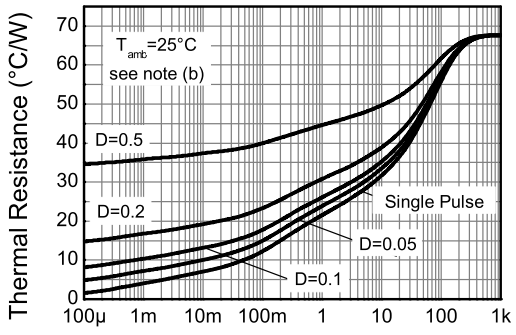
Thermal characteristics



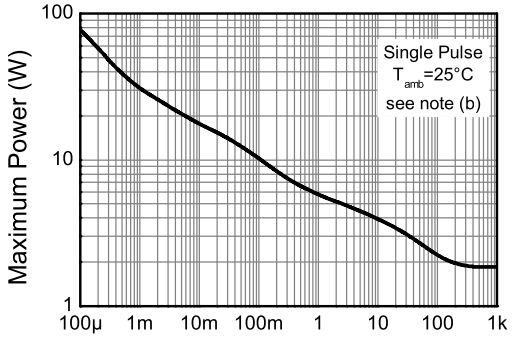
Transient Thermal Impedance



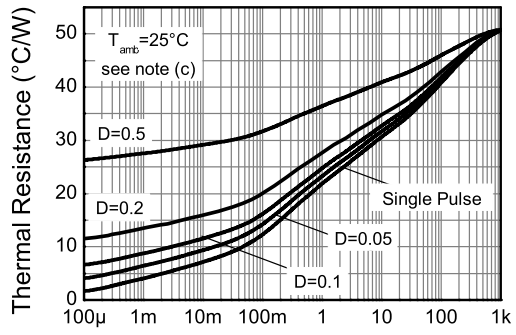
Pulse Power Dissipation



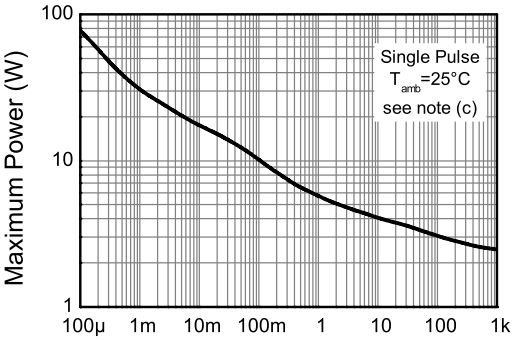
Transient Thermal Impedance



Pulse Power Dissipation



Transient Thermal Impedance



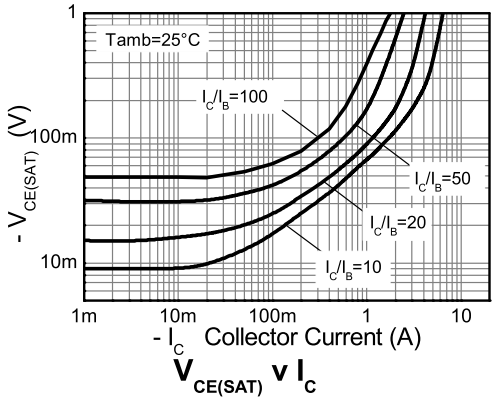
Pulse Power Dissipation

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

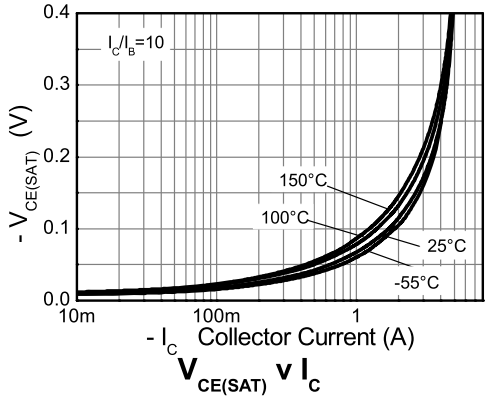
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-Base breakdown voltage	BV_{CBO}	-45	-75		V	I_C = -100μA
Collector-Emitter breakdown voltage (base open)	BV_{CEO}	-40	-65		V	I_C= -10mA (*)
Emitter-Collector breakdown voltage (reverse blocking)	BV_{ECO}	-3	-8.7		V	I_E = -100μA
Emitter-Base breakdown voltage	BV_{EBO}	-7	-8.2		V	I_E = -100μA
Collector cut-off current	I_{CBO}		<-1	-50 -0.5	nA μA	V_{CB} = -45V V_{CB} = -45V, T_{amb}=100°C
Emitter cut-off current	I_{EBO}		<-1	-50	nA	V_{EB} = -5.6V
Collector-Emitter saturation voltage	$V_{CE(sat)}$		-170 -70 -215	-265 -90 -350	mV mV mV	I_C = -1A, I_B = -20mA(*) I_C = -1A, I_B = -100mA(*) I_C = -3.5A, I_B = -350mA(*)
Base-Emitter saturation voltage	$V_{BE(sat)}$		-970	-1050	mV	I_C = -3.5A, I_B = -350mA(*)
Base-emitter turn-on voltage	$V_{BE(on)}$		-870	-950	mV	I_C = -3.5A, V_{CE} = -2V(*)
Static forward current transfer ratio	h_{FE}	300 200 20	450 300 50	900		I_C = -10mA, V_{CE} = -2V(*) I_C = -1A, V_{CE} = -2V(*) I_C = -3.5A, V_{CE} = -2V(*)
Transition frequency	f_T		270		MHz	I_C = -50mA, V_{CE} = -10V f = 100MHz
Input capacitance	C_{ibo}		142		pF	V_{EB} = -0.5V, f = 1MHz(*)
Output capacitance	C_{obo}		17.4		pF	V_{CB} = -10V, f = 1MHz(*)
Turn-on time	$t_{(on)}$		75.5		ns	V_{CC}= -15V, I_C = -750mA, I_{B1} = -I_{B2} = -15mA,
Turn-off time	$t_{(off)}$		320		ns	

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

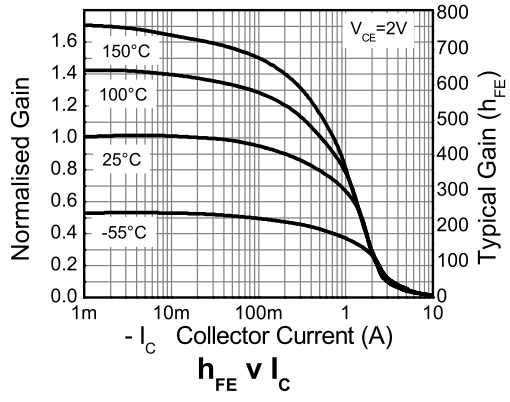
Typical characteristics



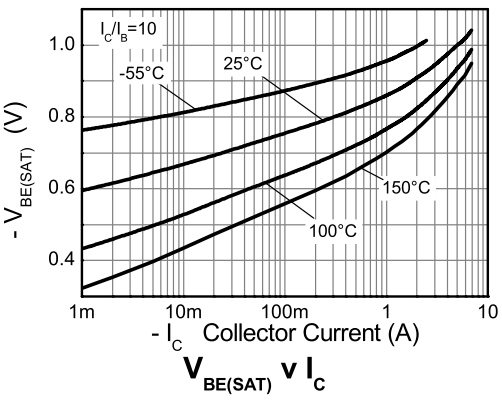
$V_{CE(SAT)}$ v I_C



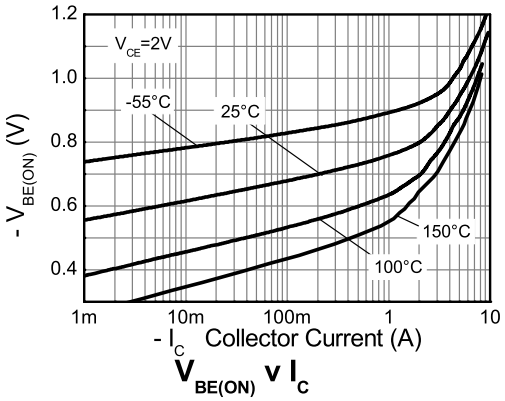
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

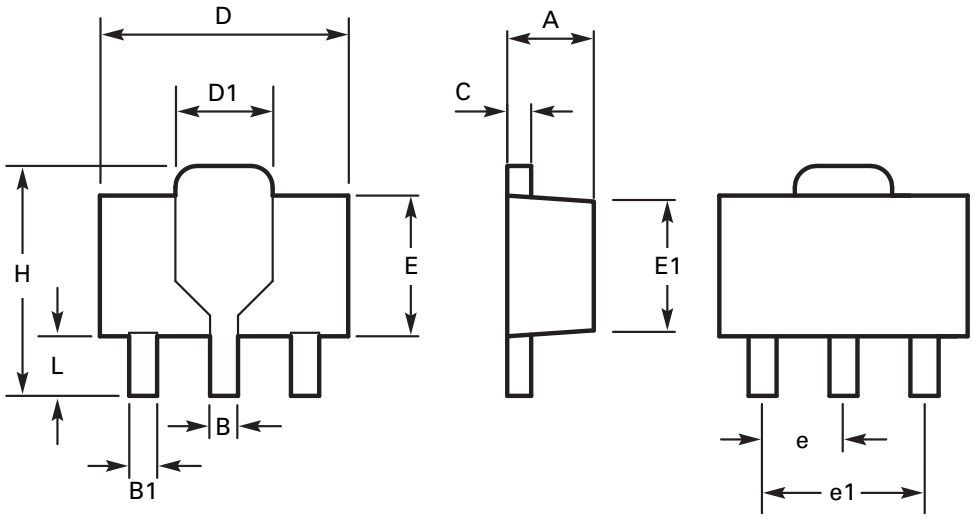


$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package outline - SOT89



DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	1.40	1.60	0.550	0.630	E	2.29	2.60	0.090	0.102
B	0.44	0.56	0.017	0.022	E1	2.13	2.29	0.084	0.090
B1	0.36	0.48	0.014	0.019	e	1.50 BSC		0.059 BSC	
C	0.35	0.44	0.014	0.017	e1	3.00 BSC		0.118 BSC	
D	4.40	4.60	0.173	0.181	H	3.94	4.25	0.155	0.167
D1	1.52	1.83	0.064	0.072	L	0.89	1.20	0.035	0.047

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

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