ZXTN25040DFL
40V, SOT23, NPN low power transistor

Summary

BV_{CEX} > 130V

BV_{CEO} > 40V

BV_{ECO} > 6V

$I_{C(cont)}$ = 1.5A

$V_{CE(sat)}$ < 85mV @ 1A

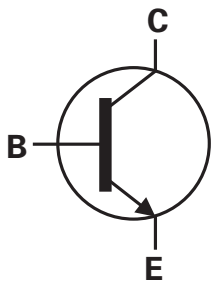
$R_{CE(sat)}$ = 59mΩ

P_D = 350mW

Complementary part number ZXTP25040DFL

Description

Advanced process capability has been used to achieve high current gain hold up making this device ideal for applications requiring high pulse currents.

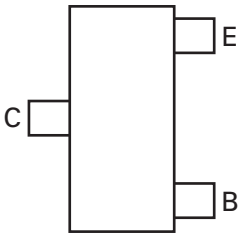


Features

- High peak current
- Low saturation voltage
- 130V forward blocking voltage
- 6V reverse blocking voltage

Applications

- MOSFET and IGBT gate driving
- DC-DC conversion
- LED driving
- Interface between low voltage IC's and loads



Pinout - top view

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN25040DFLTA	7	8	3000

Device marking

1B7

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V_{CBO}	130	V
Collector-emitter voltage (forward blocking)	V_{CEX}	130	V
Collector-emitter voltage	V_{CEO}	40	V
Emitter-collector voltage (reverse blocking)	V_{ECO}	6	V
Emitter-base voltage	V_{EBO}	7	V
Continuous collector current[a]	I_C	1.5	A
Base current	I_B	0.5	A
Peak pulse current	I_{CM}	6	A
Power dissipation at T_{amb} = 25°C[a]	P_D	350	mW
Linear derating factor		2.8	mW/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to 150	°C

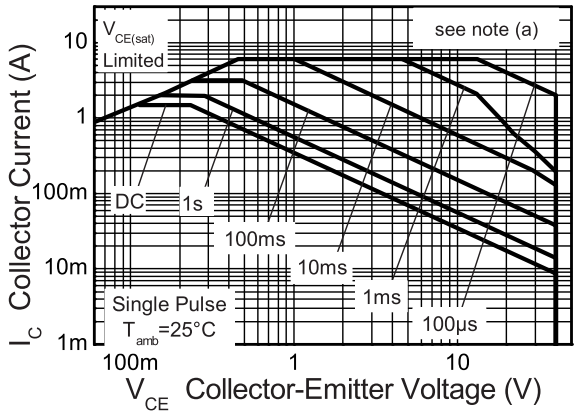
Thermal resistance

Parameter	Symbol	Limit	Unit
Junction to ambient[a]	$R_{\Theta JA}$	357	°C/W

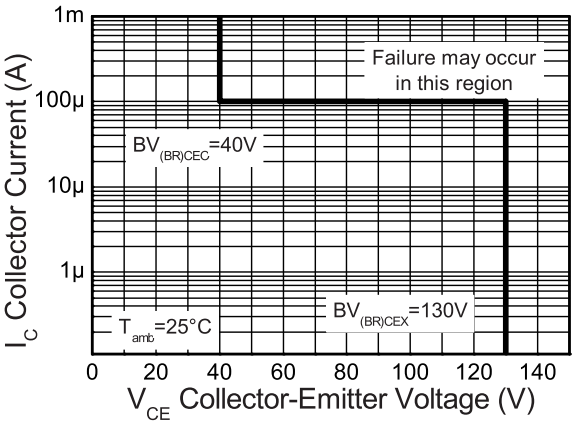
NOTES:

(a) For a device surface mounted on 25mm x 25mm x 0.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

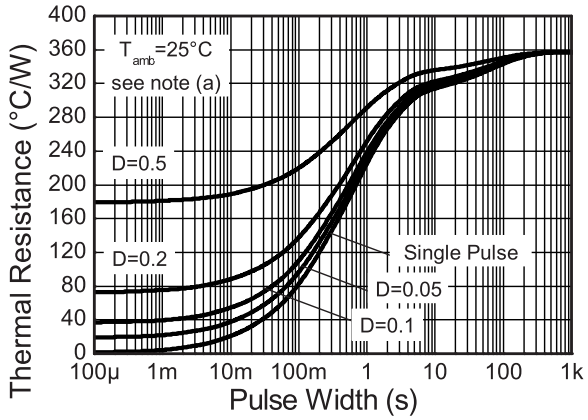
Characteristics



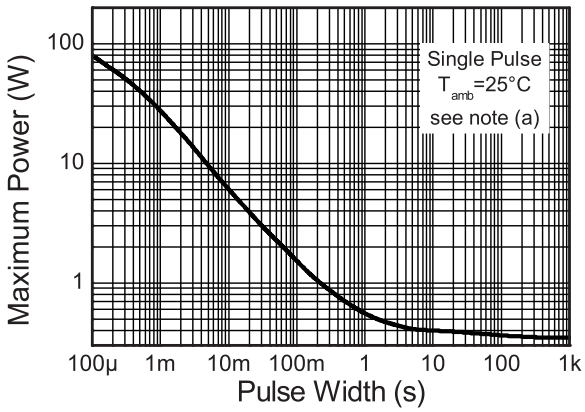
Safe Operating Area



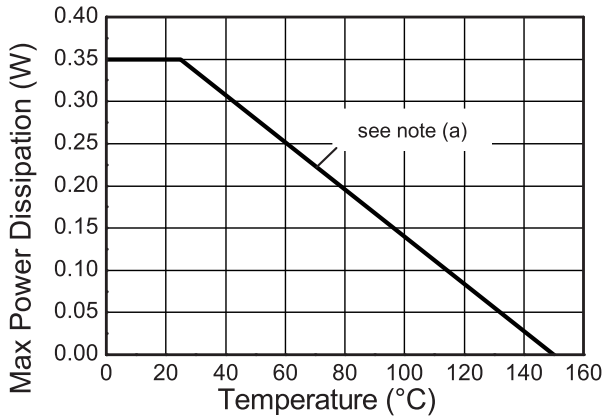
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



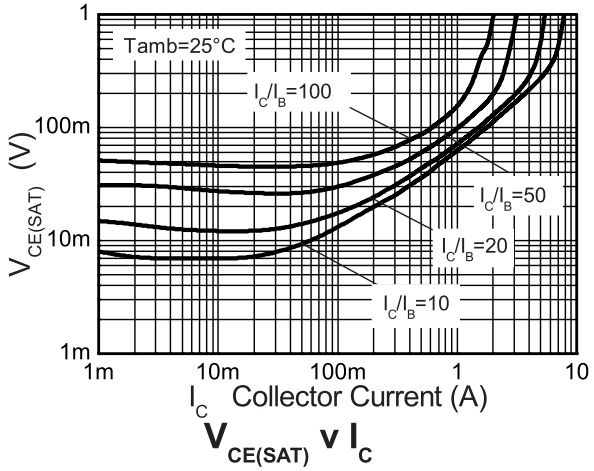
Derating Curve

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

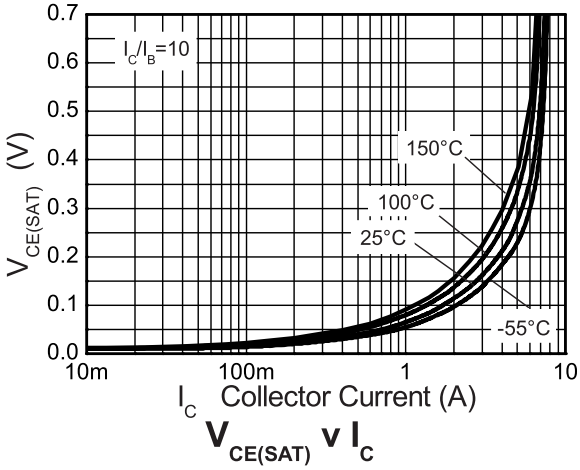
Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV_{CBO}	130	170		V	I_C = 100μA
Collector-emitter breakdown voltage (forward blocking)	BV_{CEX}	130	170		V	I_C = 100μA; R_{BE} < 1kΩ or -1V < V_{BE} < 0.25V
Collector-emitter breakdown voltage (base open)	BV_{CEO}	40	63		V	I_C = 10mA (*)
Emitter-base breakdown voltage	BV_{EBO}	7	8.3		V	I_E = 100μA
Emitter-collector breakdown voltage (reverse blocking)	BV_{ECX}	6	7.4		V	I_E = 100μA, R_{BC} < 1kΩ or 0.25V > V_{BC} > -0.25V
Emitter-collector breakdown voltage (base open)	BV_{ECO}	6	7.4		V	I_E = 100μA,
Collector cut-off current	I_{CBO}		<1	50 20	nA μA	V_{CB} = 100V V_{CB} = 100V, T_{amb}= 100°C
Collector emitter cut-off current	I_{CEX}		<1	100	nA	V_{CE} = 100V; R_{BE} < 1kΩ or -1V < V_{BE} < 0.25V
Emitter cut-off current	I_{EBO}		<1	50	nA	V_{EB} = 5.6V
Collector-emitter saturation voltage	$V_{CE(sat)}$		35	50	mV	I_C = 0.5A, I_B = 50mA(*)
			60	80	mV	I_C = 0.5A, I_B = 10mA(*)
			70	85	mV	I_C = 1A, I_B = 100mA
			145	185	mV	I_C = 1.5A, I_B = 30mA(*)
			235	285	mV	I_C = 4A, I_B = 400mA(*)
Base-emitter saturation voltage	$V_{BE(sat)}$		840	950	mV	I_C = 1.5A, I_B = 30mA(*)
Base-emitter turn-on voltage	$V_{BE(on)}$		770	850	mV	I_C = 1.5A, V_{CE} = 2V(*)
Static forward current transfer ratio	h_{FE}	300	450	900		I_C = 10mA, V_{CE} = 2V(*)
		300	400			I_C = 1A, V_{CE} = 2V(*)
		170	250			I_C = 1.5A, V_{CE} = 2V(*)
		25	40			I_C = 4A, V_{CE} = 2V(*)
Transition frequency	f_T		190		MHz	I_C = 50mA, V_{CE} = 10V f = 100MHz
Output capacitance	C_{obo}		11.7	20	pF	V_{CB} = 10V, f = 1MHz(*)
Delay time	$t_{(d)}$		64		ns	V_{CC} = 10V, I_C = 1A, I_{B1} = I_{B2}= 10mA.
Rise time	$t_{(r)}$		108		ns	
Storage time	$t_{(s)}$		428		ns	
Fall time	$t_{(f)}$		130		ns	

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

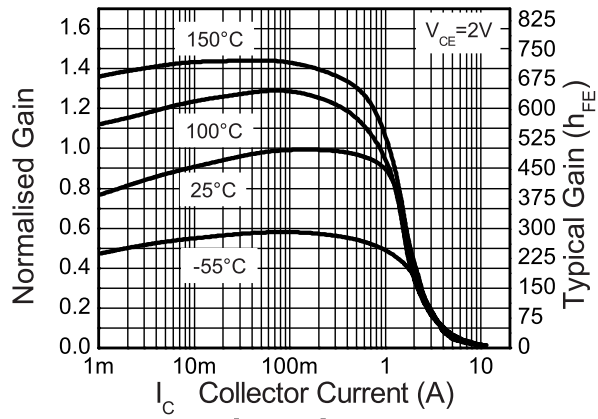
Typical characteristics



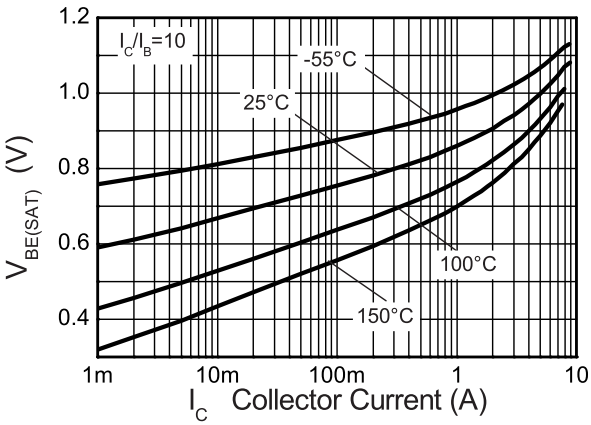
$V_{CE(SAT)}$ v I_C



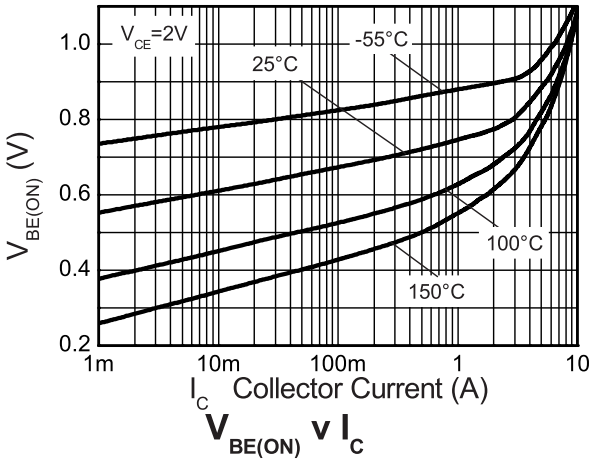
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

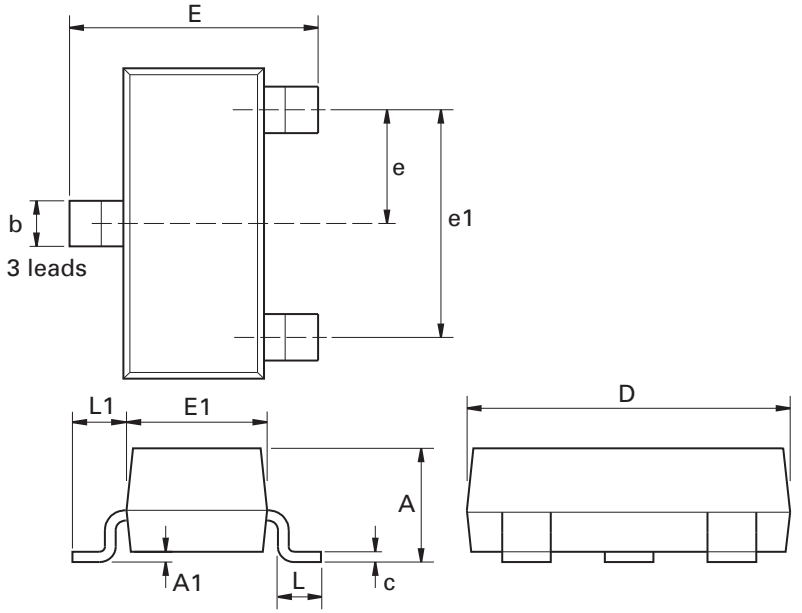


$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package outline - SOT23



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	-	1.12	-	0.044	e1	1.90 NOM		0.075 NOM	
A1	0.01	0.10	0.0004	0.004	E	2.10	2.64	0.083	0.104
b	0.30	0.50	0.012	0.020	E1	1.20	1.40	0.047	0.055
c	0.085	0.20	0.003	0.008	L	0.25	0.60	0.0098	0.0236
D	2.80	3.04	0.110	0.120	L1	0.45	0.62	0.018	0.024
e	0.95 NOM		0.037 NOM		-	-	-	-	-

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

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