

ZXT1053AK

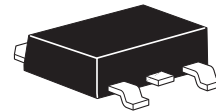
75V NPN LOW SATURATION MEDIUM POWER TRANSISTOR IN D-PAK

SUMMARY

$BV_{CEO} = 75V$; $R_{SAT} = 70m\Omega$ typical; $I_C = 5A$

DESCRIPTION

Packaged in the D-Pak outline this high current high gain 75V NPN transistor offers low on state losses making it ideal for use in DC-DC circuits and various driving and power management functions.



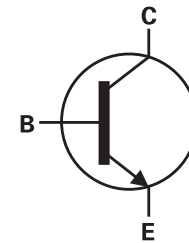
DPAK

FEATURES

- 5 amps continuous current
- Up to 10 amps peak current
- Low equivalent on resistance
- Low saturation voltages
- High h_{FE} (300 min @ 1A)

APPLICATIONS

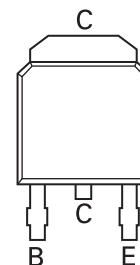
- DC - DC converters
- DC - DC modules
- Power switches
- Motor control
- Automotive circuits
- Inverter circuits



ORDERING INFORMATION

DEVICE	REEL SIZE	TAPE WIDTH	QUANTITY PER REEL
ZXT1053AKTC	13"	16mm	2500 units

PINOUT



TOP VIEW

DEVICE MARKING

- ZXT1053A

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ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Collector-base voltage	BV_{CBO}	150	V
Collector-emitter voltage	BV_{CEO}	75	V
Emitter-base voltage	BV_{EBO}	7	V
Continuous collector current ^(b)	I_C	5	A
Peak pulse current	I_{CM}	10	A
Power dissipation at $T_A = 25^\circ\text{C}$ ^(a)	P_D	2.1	W
Linear derating factor		16.8	mW/ $^\circ\text{C}$
Power dissipation at $T_A = 25^\circ\text{C}$ ^(b)	P_D	3.4	W
Linear derating factor		27.4	mW/ $^\circ\text{C}$
Power dissipation at $T_A = 25^\circ\text{C}$ ^(c)	P_D	4.4	W
Linear derating factor		9.3	mW/ $^\circ\text{C}$
Operating and storage temperature range	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

THERMAL RESISTANCE

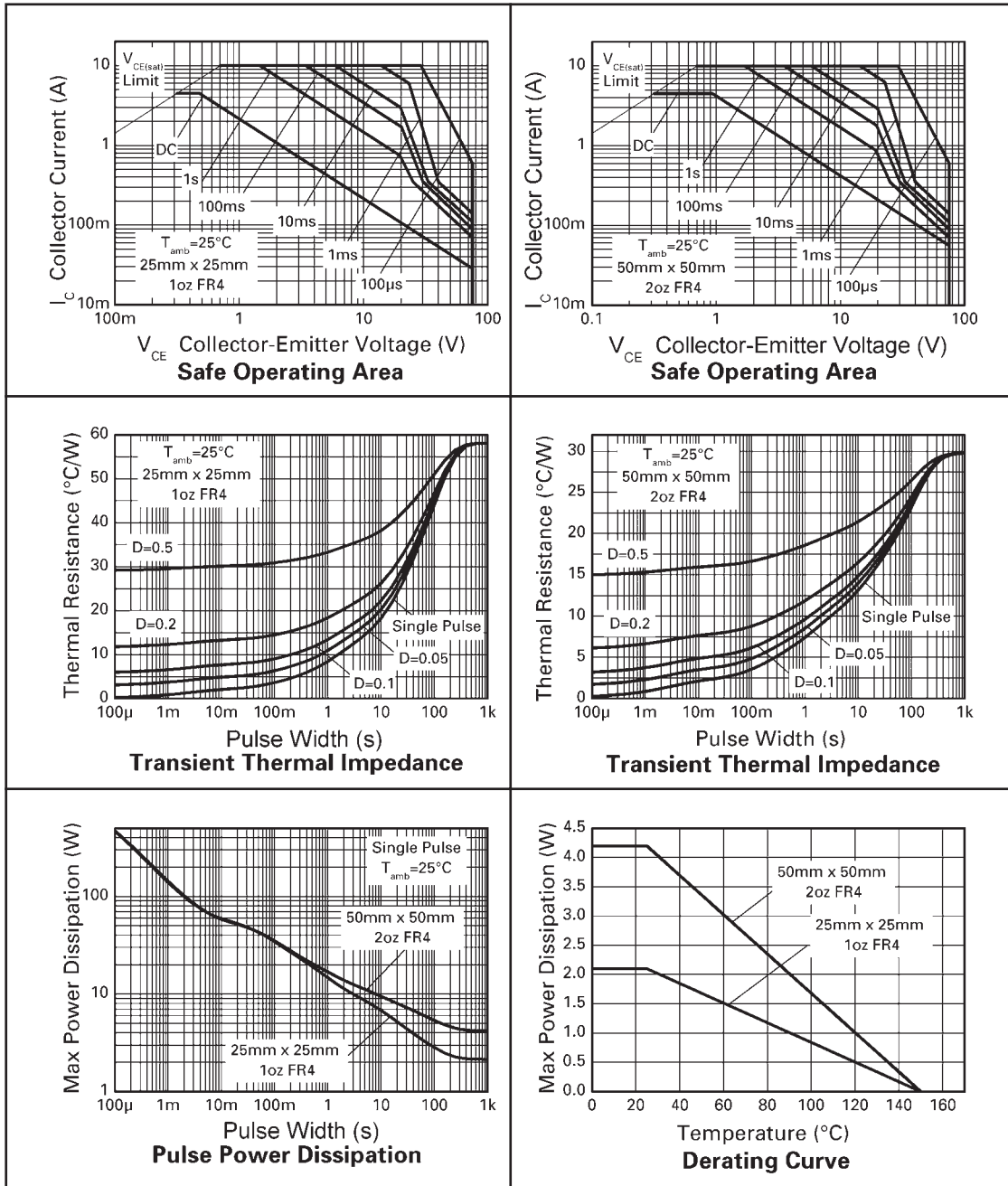
PARAMETER	SYMBOL	VALUE	UNIT
Junction to ambient ^(a)	$R_{\theta JA}$	59	$^\circ\text{C}/\text{W}$
Junction to ambient ^(b)	$R_{\theta JA}$	36	$^\circ\text{C}/\text{W}$
Junction to ambient ^(c)	$R_{\theta JA}$	28	$^\circ\text{C}/\text{W}$

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.
(c) For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper in still air conditions.

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TYPICAL CHARACTERISTICS



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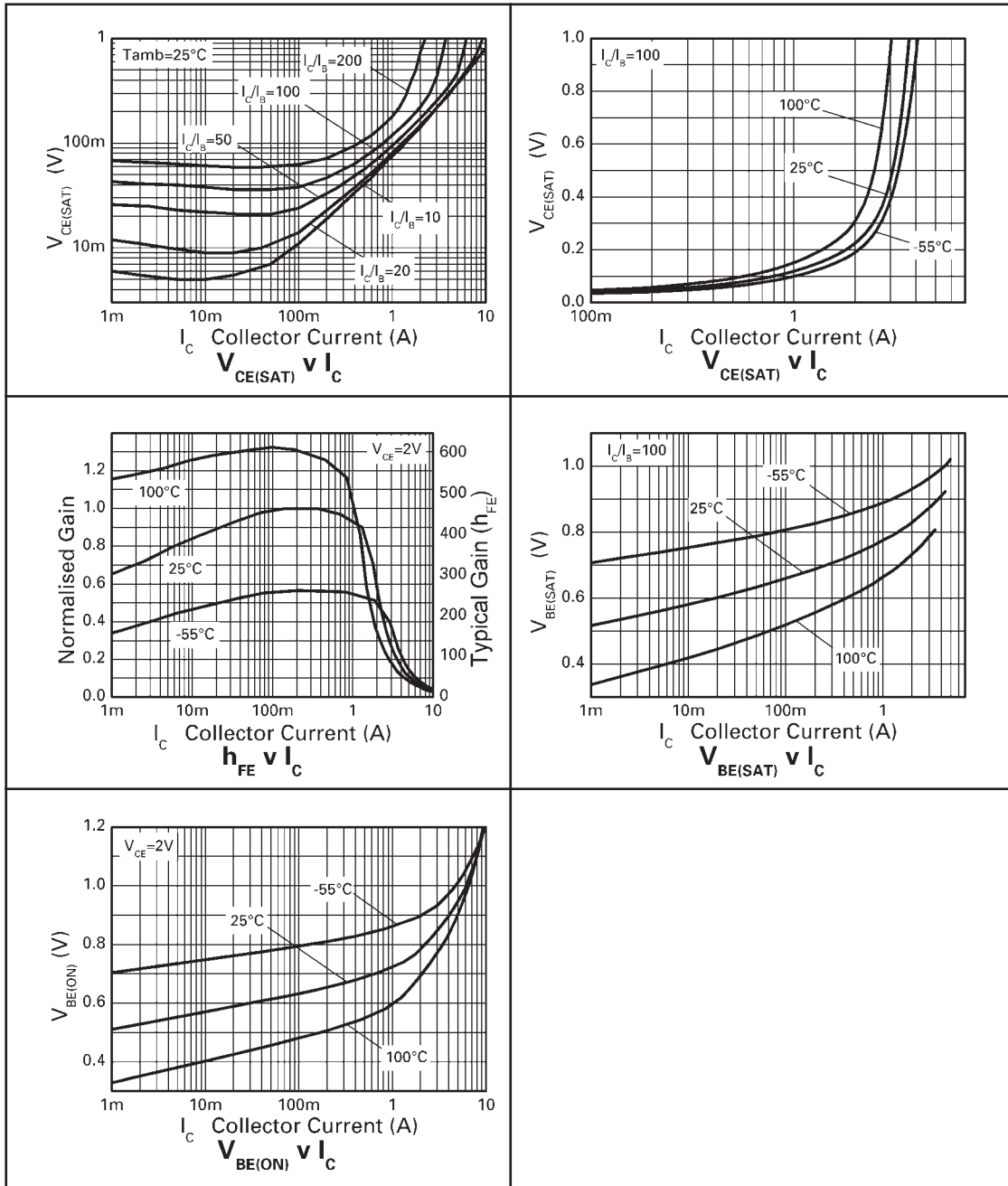
ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Collector-base breakdown voltage	BV_{CBO}	150	240		V	$I_C=100\mu\text{A}$
Collector-emitter breakdown voltage	BV_{CES}	150	240		V	$I_C=100\mu\text{A}$
Collector-emitter breakdown voltage	BV_{CEO}	75	90		V	$I_C=10\text{mA}^*$
Collector-emitter breakdown voltage	BV_{CEV}	150	240		V	$I_C=1\mu\text{A}, V_{EB}=1\text{V}$
Emitter-base breakdown voltage	BV_{EBO}	7	8.7		V	$I_E=100\mu\text{A}$
Collector cut-off current	I_{CBO}		<1	10	nA	$V_{CB}=120\text{V}$
Collector cut-off current	I_{CES}		<1	10	nA	$V_{CES}=120\text{V}$
Emitter cut-off current	I_{EBO}		<1	10	nA	$V_{EB}=6\text{V}$
Collector-emitter saturation voltage	$V_{CE(SAT)}$		19	30	mV	$I_C=0.2\text{A}, I_B=20\text{mA}^*$
			70	95	mV	$I_C=1\text{A}, I_B=100\text{mA}^*$
			120	160	mV	$I_C=1\text{A}, I_B=10\text{mA}^*$
			140	190	mV	$I_C=2\text{A}, I_B=100\text{mA}^*$
			350	460	mV	$I_C=5\text{A}, I_B=200\text{mA}^*$
Base-emitter saturation voltage	$V_{BE(SAT)}$		1.0	1.1	mV	$I_C=5\text{A}, I_B=200\text{mA}^*$
Base-emitter turn-on voltage	$V_{BE(ON)}$		0.925	1.05	mV	$I_C=5\text{A}, V_{CE}=2\text{V}^*$
Static forward current transfer ratio	H_{FE}	260	375			$I_C=10\text{mA}, V_{CE}=2\text{V}^*$
		300	450	1200		$I_C=1\text{A}, V_{CE}=2\text{V}^*$
		50	75			$I_C=5\text{A}, V_{CE}=2\text{V}^*$
		10	25			$I_C=10\text{A}, V_{CE}=2\text{V}^*$
Transition frequency	f_T		140		MHz	$I_C=50\text{mA}, V_{CE}=10\text{V}$ $f=100\text{MHz}$
Output capacitance	C_{OBO}		21	30	pF	$V_{CB}=10\text{V}, f=1\text{MHz}^*$
Switching times	t_{ON}		162		nS	$I_C=2\text{A}, V_{CC}=50\text{V},$
	t_{OFF}		900		nS	$I_{B1}=I_{B2}=20\text{mA}$

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

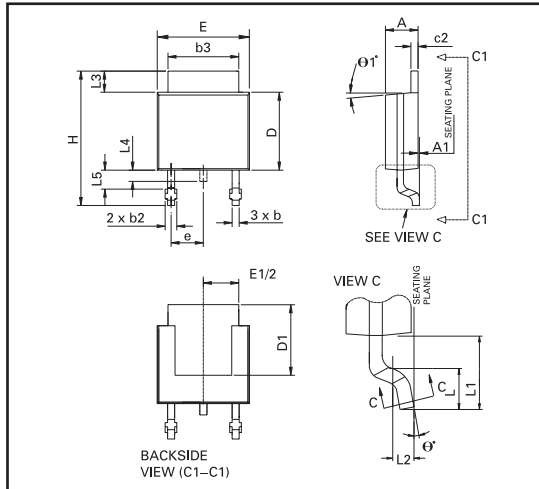
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TYPICAL CHARACTERISTICS



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PACKAGE OUTLINE



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	2.18	2.38	0.086	0.094	e	2.30 BSC		0.090 BSC	
A1	—	0.127	—	0.005	H	9.40	10.41	0.370	0.410
b	0.635	0.89	0.025	0.035	L	1.40	1.78	0.055	0.070
b2	0.762	1.114	0.030	0.045	L1	2.74 REF		0.108 REF	
b3	5.20	5.46	0.205	0.215	L2	0.051 BSC		0.020 BSC	
c	0.457	0.609	0.018	0.024	L3	0.89	1.27	0.035	0.050
c2	0.457	0.584	0.018	0.023	L4	0.635	1.01	0.025	0.040
D	5.97	6.22	0.235	0.245	L5	1.14	1.52	0.045	0.060
D1	5.20	—	0.205	—	$\Theta 1^\circ$	0°	10°	0°	10°
E	6.35	6.73	0.250	0.265	Θ°	0°	15°	0°	15°
E1	4.32	—	0.170	—	—	—	—	—	—

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