ZXT1053AK

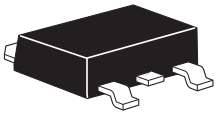
75V NPN LOW SATURATION MEDIUM POWER TRANSISTOR IN D-PAK

SUMMARY

BV_{CEO} = 75V : R_{SAT} = 70mΩ typical; I_C = 5A

DESCRIPTION

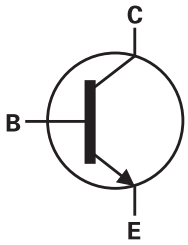
Packaged in the D-Pak outline this high current high gain 75V NPN transistor offers low on state losses making it ideal for use in DC-DC circuits and various driving and power management functions.



DPAK

FEATURES

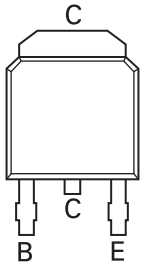
- 5 amps continuous current
- Up to 10 amps peak current
- Low equivalent on resistance
- Low saturation voltages
- High h_{FE} (300 min @ 1A)



APPLICATIONS

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

PINOUT



TOP VIEW

ORDERING INFORMATION

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

DEVICE MARKING

- ZXT1053A

ZXT1053AK

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°C [a]	P_D	2.1	W
Linear derating factor		16.8	mW/°C
Power dissipation at T_A =25°C [b]	P_D	3.4	W
Linear derating factor		27.4	mW/°C
Power dissipation at T_A =25°C [c]	P_D	4.4	W
Linear derating factor		9.3	mW/°C
Operating and storage temperature range	T_j, T_{stg}	-55 to +150	°C

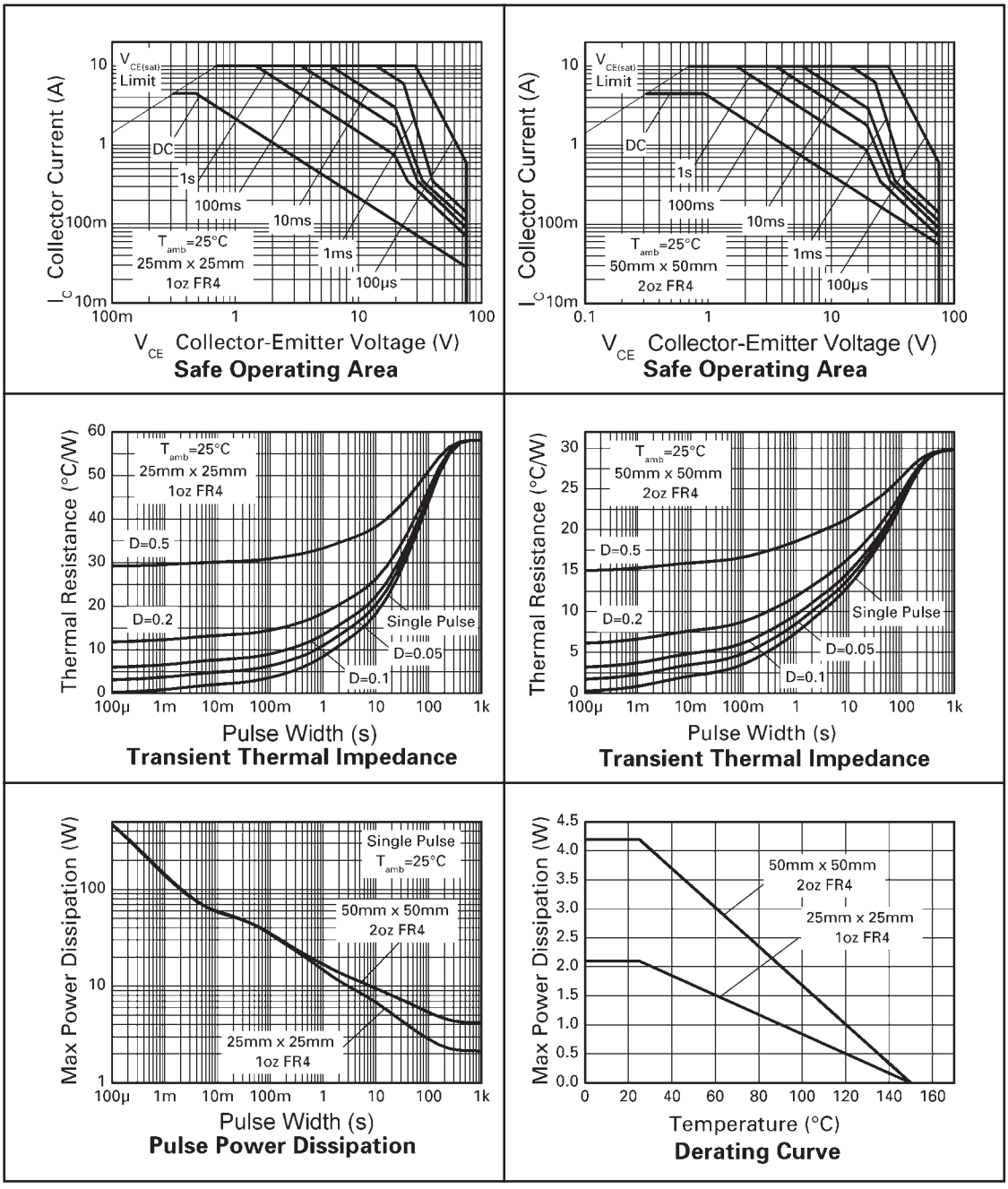
THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to ambient [a]	$R_{\Theta JA}$	59	°C/W
Junction to ambient [b]	$R_{\Theta JA}$	36	°C/W
Junction to ambient [c]	$R_{\Theta JA}$	28	°C/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.

TYPICAL CHARACTERISTICS



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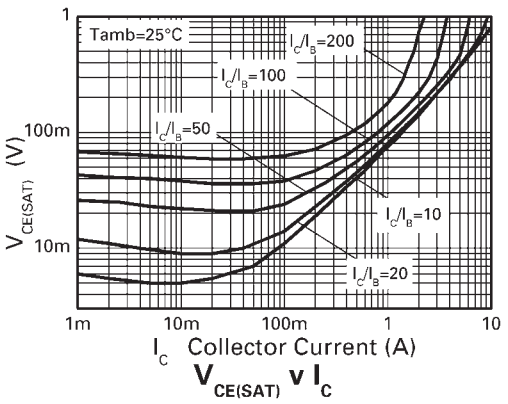
ELECTRICAL CHARACTERISTICS (at T_{amb} = 25°C unless otherwise stated)

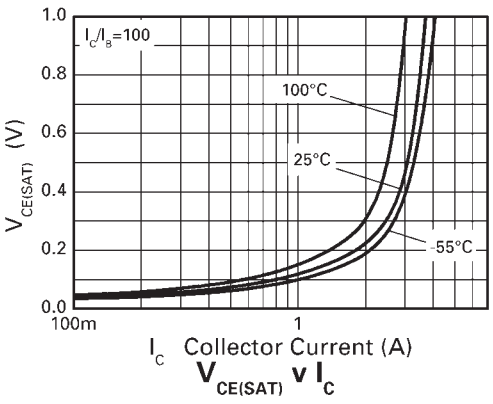
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Collector-base breakdown voltage	BV_{CBO}	150	240		V	I_C=100μA
Collector-emitter breakdown voltage	BV_{CES}	150	240		V	I_C=100μA
Collector-emitter breakdown voltage	BV_{CEO}	75	90		V	I_C=10mA*
Collector-emitter breakdown voltage	BV_{CEV}	150	240		V	I_C=1μA,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

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

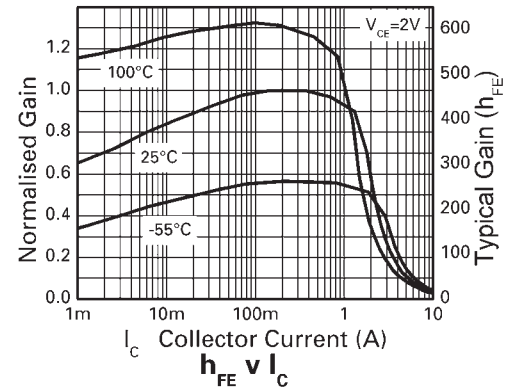
TYPICAL CHARACTERISTICS



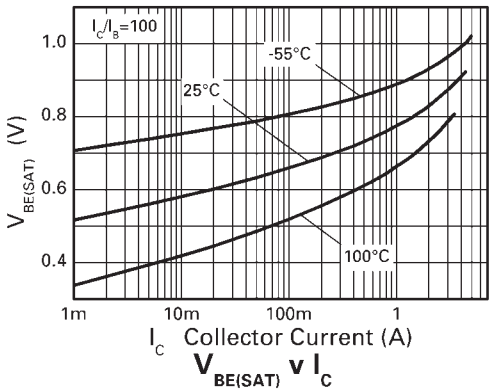
$V_{CE(SAT)}$ v I_C



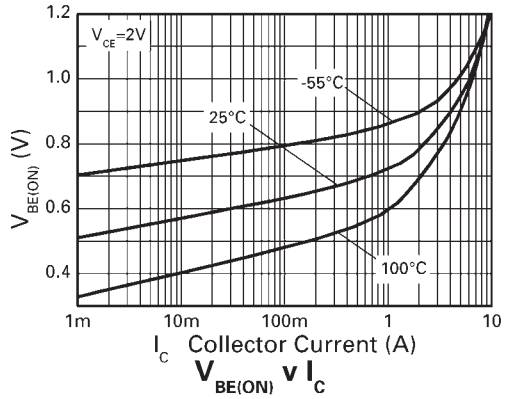
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

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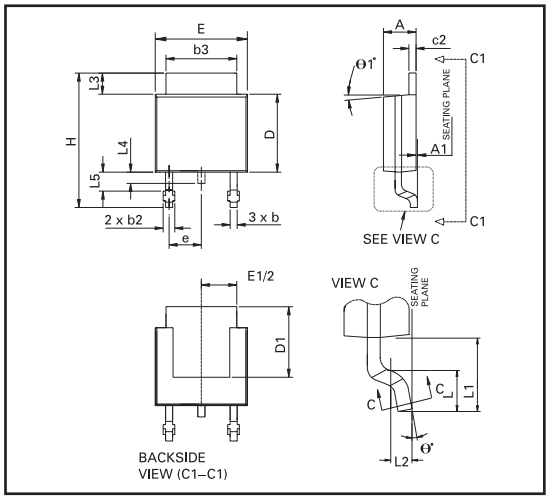
PACKAGE OUTLINE



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	—	θ1°	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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