

## 12V PNP SILICON LOW SATURATION SWITCHING TRANSISTOR AND SCHOTTKY DIODE

### SUMMARY

Transistor:  $V_{CE0} = -12V$ ,  $I_C = -1.25A$

Schottky Diode:  $V_R = 40V$ ;  $I_C = 0.5A$

### DESCRIPTION

A PNP transistor and a Schottky Barrier diode contained in a single 6 leaded SOT23 package.

### FEATURES

- Low Saturation Transistor
- High Gain - 300 minimum
- Low  $V_F$ , fast switching Schottky

### APPLICATIONS

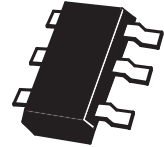
- Mobile telecomms, PCMCIA & SCSI
- DC-DC Conversion

### ORDERING INFORMATION

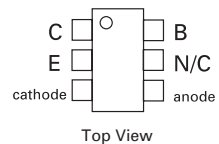
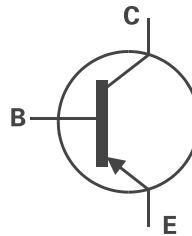
DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXTS1000E6TA	7	8mm embossed	3000 units
ZXTS1000E6TC	13	8mm embossed	10000 units

### DEVICE MARKING

1000



**SOT23-6**



# ZXTS1000E6

## ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	VALUE	UNIT
<b>Transistor</b>			
Collector-Base Voltage	$V_{CBO}$	-12	V
Collector-Emitter Voltage	$V_{CEO}$	-12	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Continuous Collector Current	$I_C$	-1.25	A
<b>Schottky Diode</b>			
Continuous Reverse Voltage	$V_R$	40	V
Forward Current	$I_F$	0.5	A
Non Repetitive Forward Current $t \leq 100\mu s$	$I_{FSM}$	6.75	A
$t \leq 10ms$		3	A
<b>Package</b>			
Power Dissipation at $T_{amb}=25^\circ C$ single die "on" both die "on"	$P_D$	0.725	W
		0.885	W
Storage Temperature Range	$T_{stg}$	-55 to +150	$^\circ C$
Junction Temperature	$T_j$	125	$^\circ C$

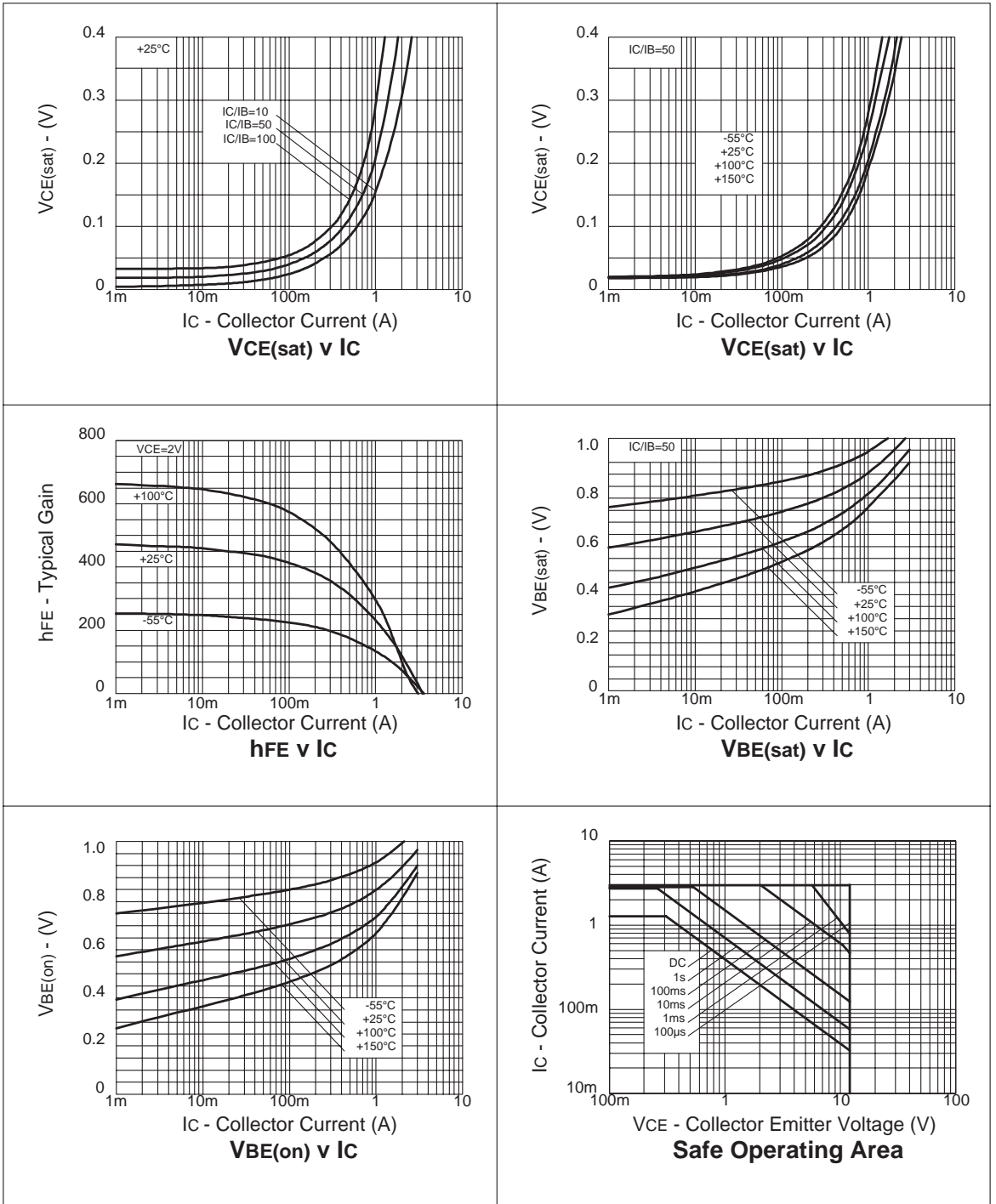
## THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a) single die "on"	$R_{\theta JA}$	138	$^\circ C/W$
both die "on"	$R_{\theta JA}$	113	$^\circ C/W$

### NOTES

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

## TRANSISTOR TYPICAL CHARACTERISTICS



# ZXTS1000E6

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

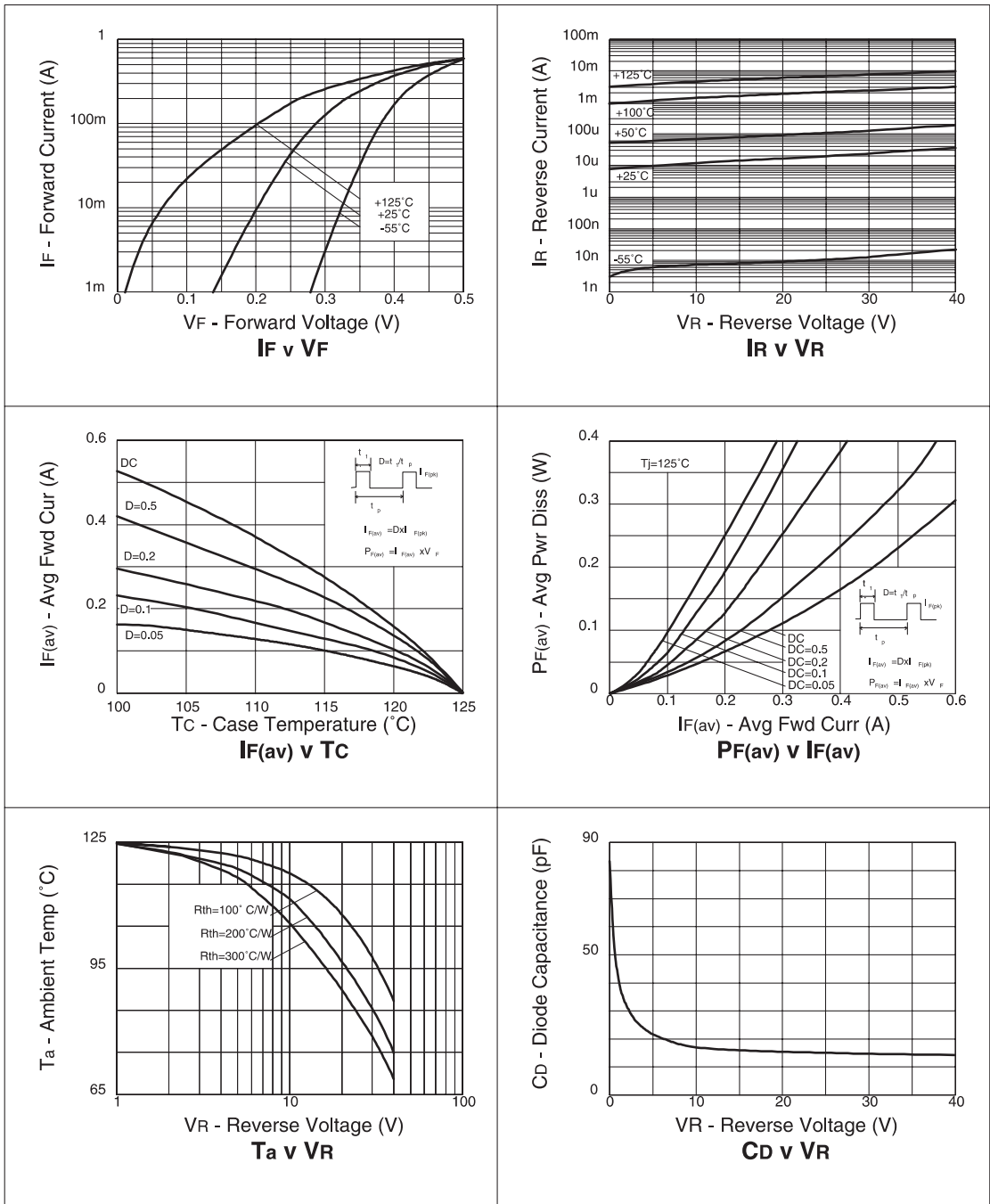
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
<b>TRANSISTOR ELECTRICAL CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-12			V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-12			V	$I_C = -10\text{mA}^*$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5			V	$I_E = -100\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$			-10	nA	$V_{CB} = -10\text{V}$
Emitter Cut-Off Current	$I_{EBO}$			-10	nA	$V_{EB} = -4\text{V}$
Collector Emitter Cut-Off Current	$I_{CES}$			-10	nA	$V_{CES} = -10\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$		-25 -55 -110 -160 -185	-40 -100 -175 -215 -240	mV mV mV mV mV	$I_C = -0.1\text{A}, I_B = -10\text{mA}^*$ $I_C = -0.25\text{A}, I_B = -10\text{mA}^*$ $I_C = -0.5\text{A}, I_B = -10\text{mA}^*$ $I_C = -1\text{A}, I_B = -50\text{mA}^*$ $I_C = -1.25\text{A}, I_B = -100\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-990	-1100	mV	$I_C = -1.25\text{A}, I_B = -100\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-850	-1000	mV	$I_C = -1.25\text{A}, V_{CE} = 2\text{V}^*$
Static Forward Current Transfer Ratio	$h_{FE}$	300 300 200 125 75 30	490 450 340 250 140 80			$I_C = -10\text{mA}, V_{CE} = -2\text{V}^*$ $I_C = -0.1\text{A}, V_{CE} = -2\text{V}^*$ $I_C = -0.5\text{A}, V_{CE} = -2\text{V}^*$ $I_C = -1.25\text{A}, V_{CE} = -2\text{V}^*$ $I_C = -2\text{A}, V_{CE} = -2\text{V}^*$ $I_C = -3\text{A}, V_{CE} = -2\text{V}^*$
Transition Frequency	$f_T$		220		MHz	$I_C = -50\text{mA}, V_{CE} = -10\text{V}$ $f = 100\text{MHz}$
Output Capacitance	$C_{obo}$		15		pF	$V_{CB} = -10\text{V}, f = 1\text{MHz}$
Turn-On Time	$t_{(on)}$		50		ns	$V_{CC} = -10\text{V}, I_C = -1\text{A}$ $I_{B1} = I_{B2} = -100\text{mA}$
Turn-Off Time	$t_{(off)}$		135		ns	

## SCHOTTKY DIODE ELECTRICAL CHARACTERISTICS

Reverse Breakdown Voltage	$V_{(BR)R}$	40	60		V	$I_R = 200\mu\text{A}$
Forward Voltage	$V_F$		270 300 370 425 550 640 810	300 350 460 550 670 780 1050	mV mV mV mV mV mV mV	$I_F = 50\text{mA}^*$ $I_F = 100\text{mA}^*$ $I_F = 250\text{mA}^*$ $I_F = 500\text{mA}^*$ $I_F = 750\text{mA}^*$ $I_F = 1000\text{mA}^*$ $I_F = 1500\text{mA}^*$
Reverse Current	$I_R$		15	40	$\mu\text{A}$	$V_R = 30\text{V}$
Diode Capacitance	$C_D$		20		pF	$f = 1\text{MHz}, V_R = 30\text{V}$
Reverse Recovery Time	$t_{rr}$		10		ns	switched from $I_F = 500\text{mA}$ to $I_R = 500\text{mA}$ Measured at $I_R = 50\text{mA}$

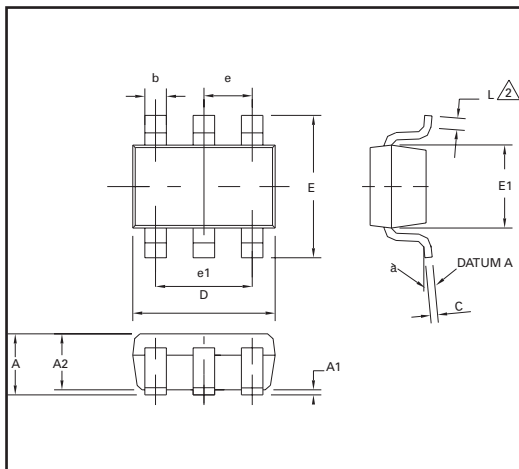
\*Measured under pulsed conditions.

## DIODE TYPICAL CHARACTERISTICS

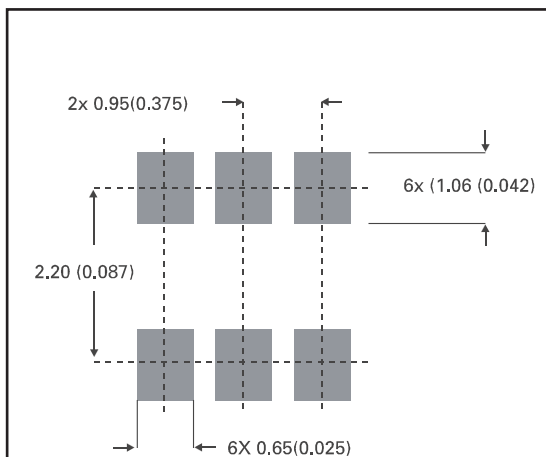


# ZXTS1000E6

## PACKAGE DIMENSIONS



## PAD LAYOUT DETAILS



DIM	Millimetres		Inches	
	Min	Max	Min	Max
A	0.90	1.45	0.35	0.057
A1	0.00	0.15	0	0.006
A2	0.90	1.30	0.035	0.051
b	0.35	0.50	0.014	0.019
C	0.09	0.20	0.0035	0.008
D	2.80	3.00	0.110	0.118
E	2.60	3.00	0.102	0.118
E1	1.50	1.75	0.059	0.069
L	0.10	0.60	0.004	0.002
e	0.95 REF		0.037 REF	
e1	1.90 REF		0.074 REF	
L	0°	10°	0°	10°

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