

ZXTD6717E6

COMPLEMENTARY NPN/PNP LOW SATURATION DUAL TRANSISTORS

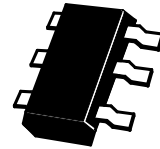
SUMMARY

NPN: $V_{CE0}=15V$; $V_{CE(sat)}=0.1V$; $I_C=1.5A$;

PNP: $V_{CE0}=-12V$; $V_{CE(sat)}=-0.175V$; $I_C=-1.25A$;

DESCRIPTION

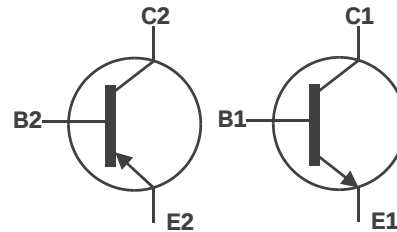
This new combination device comprises a complementary NPN and PNP low saturation transistor housed in the SOT23-6 package. Users benefit from very efficient performance combining a high current operation, exceptionally low $V_{CE(sat)}$ and high H_{FE} resulting in extremely low on state losses. This dual transistor is ideal for use in a variety of efficient driving functions including motors, lamps, relays and solenoids and will also benefit circuits requiring high output current switching.



SOT23-6

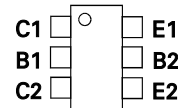
FEATURES

- Low Saturation Voltage
- $R_{CE(sat)}$ values NPN $\approx 135m\Omega$ at 1.5A
 PNP $\approx 150m\Omega$ at 1.25A
- h_{FE} min 200 at 1A
- $I_C=1.5A$ Continuous (NPN), 1.25A (PNP)
- SOT23-6 package with $P_D = 1.1W$



APPLICATIONS

- Various driving functions
 Lamps
 Motors
 Relays and solenoids
- High output current switches



Top View

ORDERING INFORMATION

DEVICE	REEL SIZE (inches)	TAPE WIDTH (mm)	QUANTITY PER REEL
ZXTD6717E6TA	7	8mm embossed	3000 units
ZXTD6717E6TC	13	8mm embossed	10000 units

DEVICE MARKING

6717

ZXTD6717E6

ABSOLUTE MAXIMUM RATINGS.

PARAMETER	SYMBOL	LIMIT NPN	LIMIT PNP	UNIT
Collector-Base Voltage	V_{CBO}	15	-12	V
Collector-Emitter Voltage	V_{CEO}	15	-12	V
Emitter-Base Voltage	V_{EBO}	5	-5	V
Peak Pulse Current	I_{CM}	5	-3	A
Continuous Collector Current	I_C	1.5	-1.25	A
Base Current	I_B	200	-200	mA
Power Dissipation at $T_A=25^{\circ}\text{C}$ (a) Linear Derating Factor	P_D	1.1 8.8	1.1 8.8	W mW/ $^{\circ}\text{C}$
Power Dissipation at $T_A=25^{\circ}\text{C}$ (b) Linear Derating Factor	P_D	1.7 13.6	1.7 13.6	W mW/ $^{\circ}\text{C}$
Operating and Storage Temperature Range	$T_J:T_{stg}$	-55 to +150	-55 to +150	$^{\circ}\text{C}$

THERMAL RESISTANCE

PARAMETER	SYMBOL	VALUE	UNIT
Junction to Ambient (a)	$R_{\theta JA}$	125	$^{\circ}\text{C}/\text{W}$
Junction to Ambient (b)	$R_{\theta JA}$	45	$^{\circ}\text{C}/\text{W}$

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

(b) For a device surface mounted on FR4 PCB measured at $t \leq 5$ secs.

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NPN TRANSISTOR

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	15			V	$I_C=100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	15			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	$V_{CE(sat)}$		16.5 40 75 150 205	20 55 100 200 245	mV mV mV mV mV	$I_C=100\text{mA}, I_B=10\text{mA}^*$ $I_C=250\text{mA}, I_B=10\text{mA}^*$ $I_C=500\text{mA}, I_B=10\text{mA}^*$ $I_C=1\text{A}, I_B=10\text{mA}^*$ $I_C=1.5\text{A}, I_B=20\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		0.93	1.1	V	$I_C=1.5\text{A}, I_B=20\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		0.865	1.1	V	$I_C=1.5\text{A}, V_{CE}=2\text{V}^*$
Static Forward Current Transfer Ratio	h_{FE}	200 300 250 200 75 30	420 450 390 300 150 75			$I_C=10\text{mA}, V_{CE}=2\text{V}^*$ $I_C=100\text{mA}, V_{CE}=2\text{V}^*$ $I_C=500\text{mA}, V_{CE}=2\text{V}^*$ $I_C=1\text{A}, V_{CE}=2\text{V}^*$ $I_C=3\text{A}, V_{CE}=2\text{V}^*$ $I_C=5\text{A}, V_{CE}=2\text{V}^*$
Transition Frequency	f_T		180		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	$I_C=1\text{A}, V_{CC}=10\text{V}$
Turn-Off Time	$t_{(off)}$		250		ns	$I_{B1}=I_{B2}=100\text{mA}$

*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

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PNP TRANSISTOR

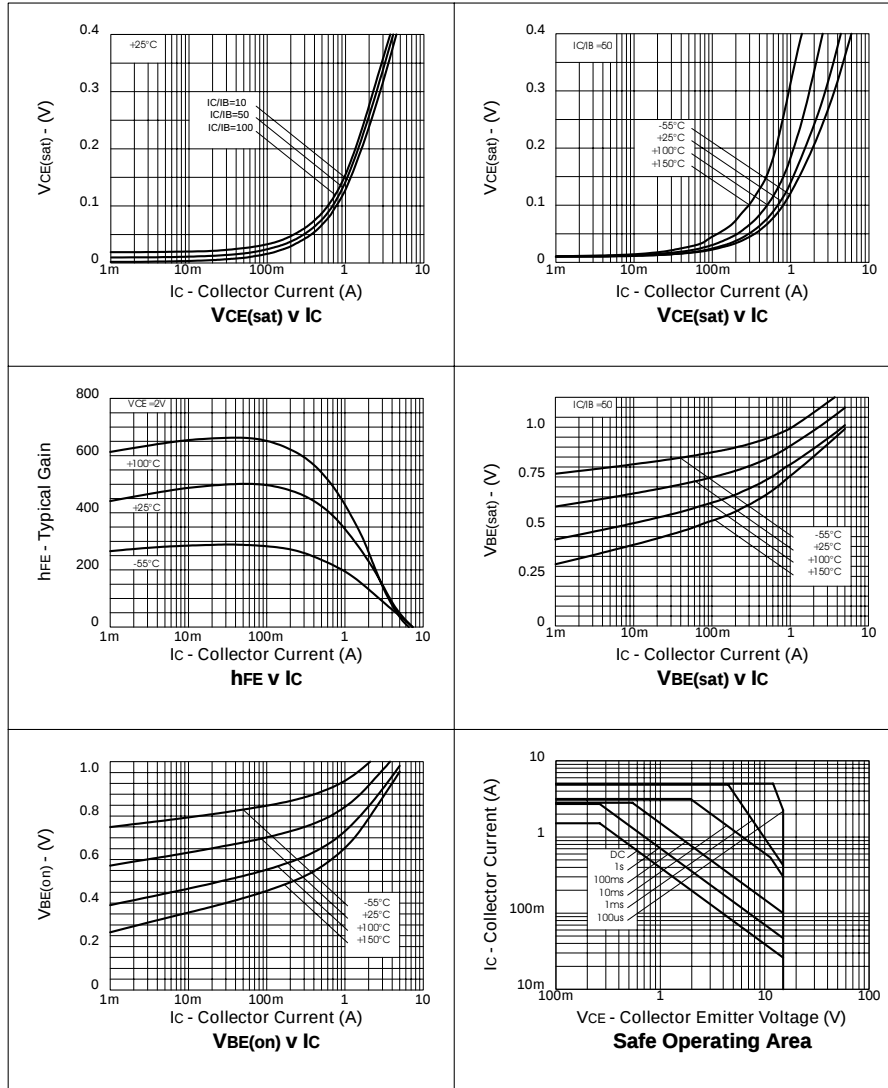
ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS.
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	$I_C = -100\text{mA}, I_B = -10\text{mA}^*$ $I_C = -250\text{mA}, I_B = -10\text{mA}^*$ $I_C = -500\text{mA}, I_B = -10\text{mA}^*$ $I_C = -1\text{A}, I_B = -50\text{mA}^*$ $I_C = -1.25\text{A}, I_B = -100\text{mA}^*$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$		-0.99	-1.10	V	$I_C = -1.25\text{A}, I_B = -100\text{mA}^*$
Base-Emitter Turn-On Voltage	$V_{BE(on)}$		-0.85	-1.0	V	$I_C = -1.25\text{A}, V_{CE} = -2\text{V}^*$
Static Forward Current Transfer Ratio	h_{FE}	300 300 200 125 75 30	490 450 340 250 140 80			$I_C = -10\text{mA}, V_{CE} = -2\text{V}^*$ $I_C = -100\text{mA}, V_{CE} = -2\text{V}^*$ $I_C = -500\text{mA}, V_{CE} = -2\text{V}^*$ $I_C = -1.25\text{A}, V_{CE} = -2\text{V}^*$ $I_C = -2\text{A}, V_{CE} = -2\text{V}^*$ $I_C = -3\text{A}, V_{CE} = -2\text{V}^*$
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	$I_C = -1\text{A}, V_{CC} = -10\text{V}$
Turn-Off Time	$t_{(off)}$		135		ns	$I_{B1} = I_{B2} = -100\text{mA}$

*Measured under pulsed conditions. Pulse width=300 μs . Duty cycle $\leq 2\%$

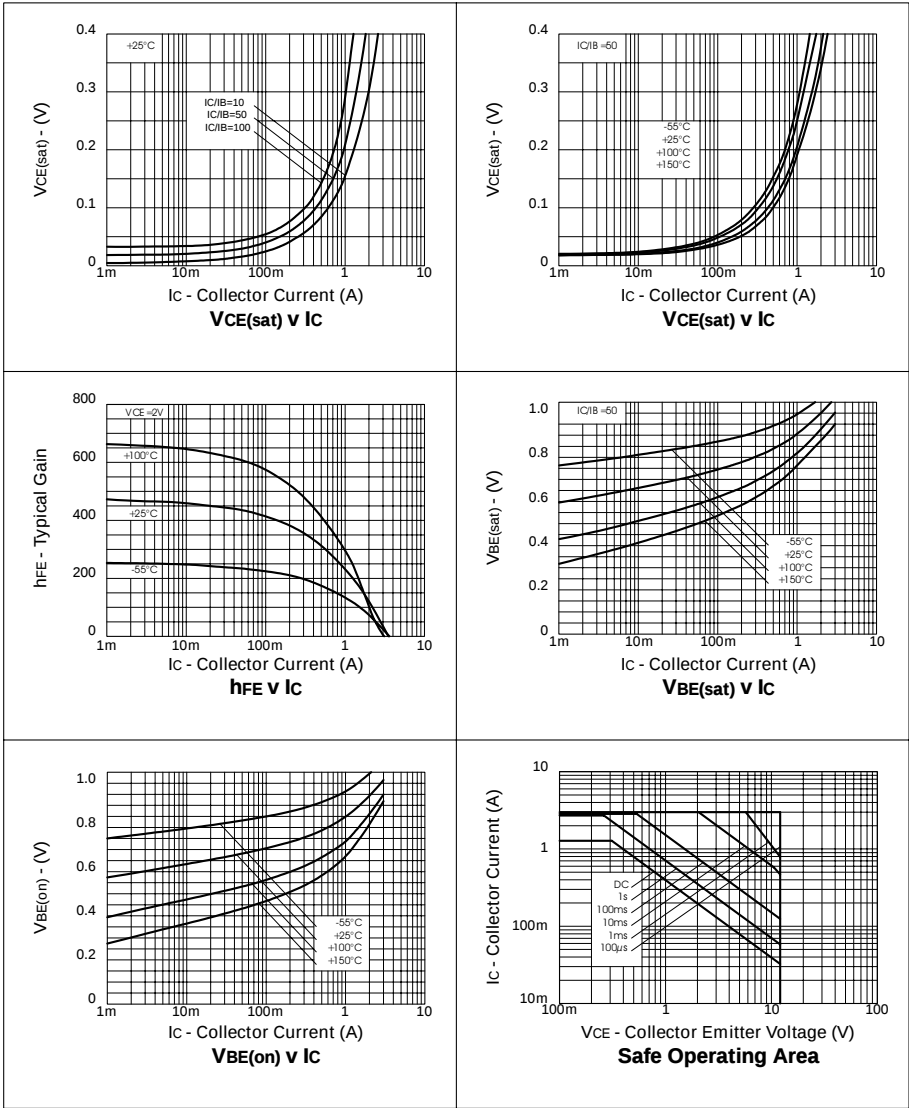
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NPN TYPICAL CHARACTERISTICS



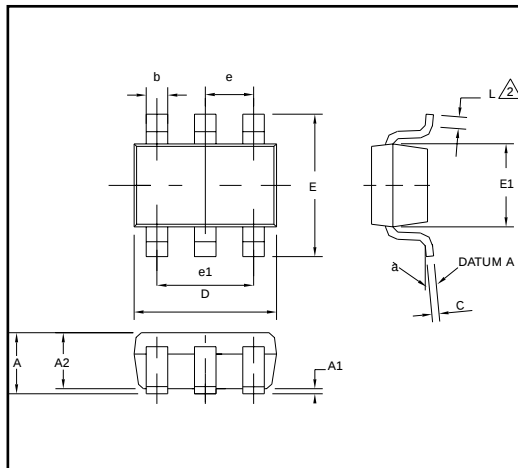
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PNP TYPICAL CHARACTERISTICS

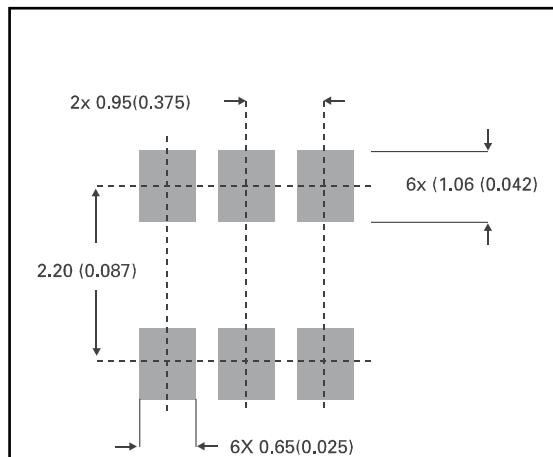


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PACKAGE DIMENSIONS



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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