Lead-free Green

ZXTD2090E6

DUAL 50V NPN SILICON LOW SATURATION SWITCHING TRANSISTOR

Features

- BV_{CEO} = 50V
- R_{SAT} = 160mV
- I_C = 1A Continuous Collector Current
- Low Equivalent On Resistance
- Low Saturation Voltage
- SOT23-6 package
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **"Green" Devices (Note 2)**

Mechanical Data

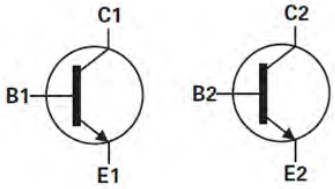
- Case: SOT23-6
- Case material: Molded Plastic. "Green" Molding Compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.018 grams (approximate)

Applications

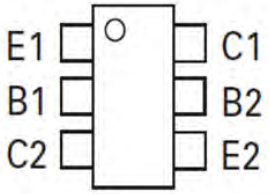
- LCD Backlighting inverter circuits
- Boost functions in DC-DC converters

SOT-223

Top View



Device symbol



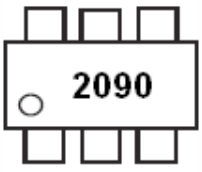
Pin Configuration

Ordering Information

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTD2090E6TA	2090	7	8	3000

Notes: 1. No purposefully added lead. Halogen and Antimony Free.
2. Diodes Inc.'s "Green" Policy can be found on our website at http://www.diodes.com.

Marking Information



2090 = Product type Marking Code

DUAL 50V NPN SILICON LOW SATURATION SWITCHING TRANSISTOR

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	50	V
Emitter-Base Voltage	V_{EBO}	5	V
Continuous Collector Current (Note 5)	I_C	1	A
Base current	I_B	200	mA
Peak Pulse Current	I_{CM}	2	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation at T_A = 25°C (Notes 3 & 6) Linear derating factor	P_D	0.90 7.2	W mW /°C
Power Dissipation at T_A = 25°C (Notes 3 & 7) Linear derating factor	P_D	1.1 8.8	W mW /°C
Power Dissipation at T_A = 25°C (Notes 4 & 6) Linear derating factor	P_D	1.7 13.6	W mW /°C
Thermal Resistance, Junction to Ambient (Notes 3 & 6)	$R_{\theta JA}$	139	°C/W
Thermal Resistance, Junction to Ambient (Notes 4 & 6)	$R_{\theta JA}$	73	°C/W
Thermal Resistance, Junction to Ambient (Notes 3 & 7)	$R_{\theta JA}$	113	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes:
3. For a device surface mounted on 25mm X 25mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions
4. For a device surface mounted on FR4 PCB measured at < 5sec
5. Repetitive rating – pulse width limited by maximum junction temperature. Refer to transient thermal impedance graph
6. For a device with one active die
7. For a device with two die running at equal power

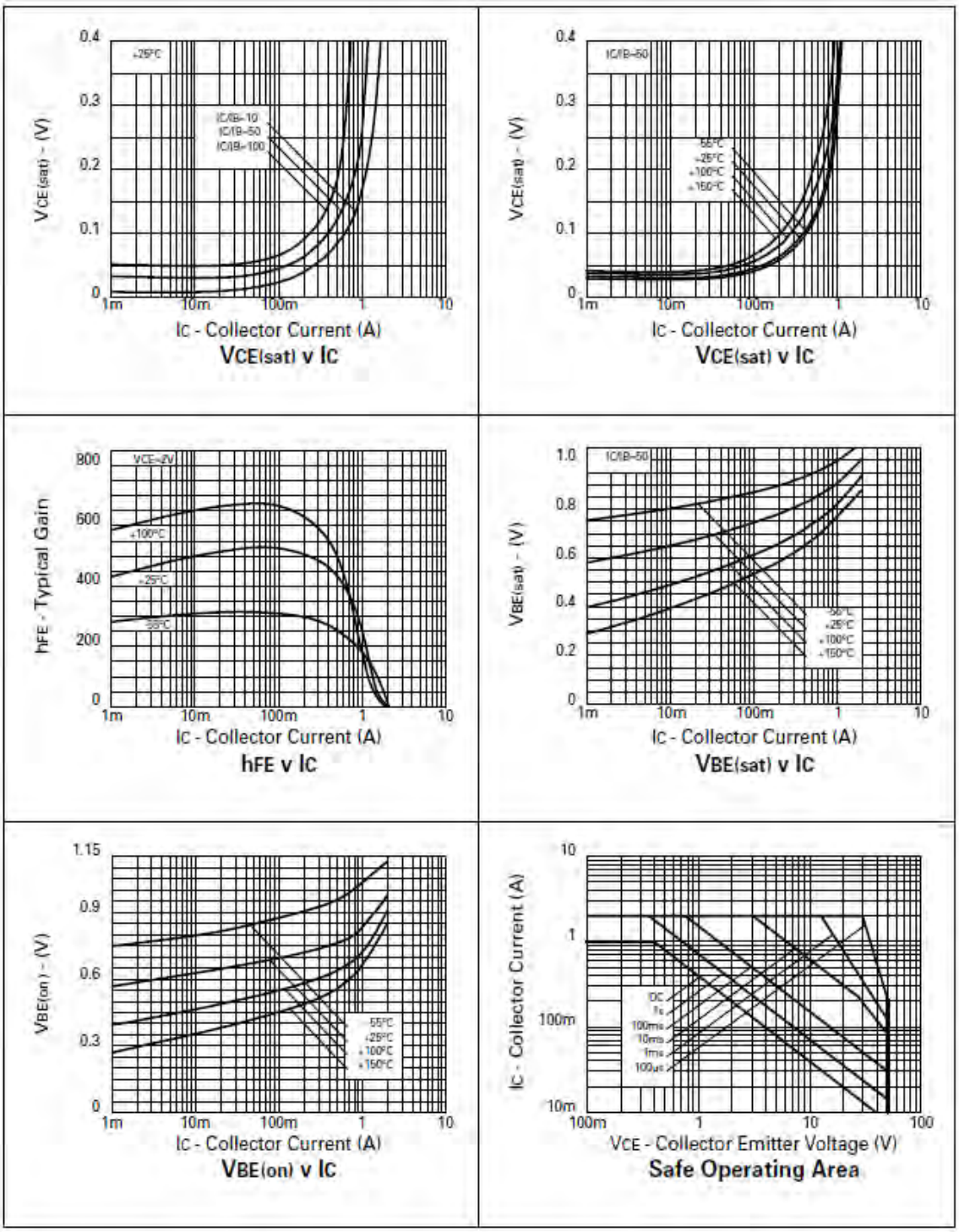
DUAL 50V NPN SILICON LOW SATURATION SWITCHING TRANSISTOR

Electrical Characteristics @T_A = 25°C unless otherwise specified

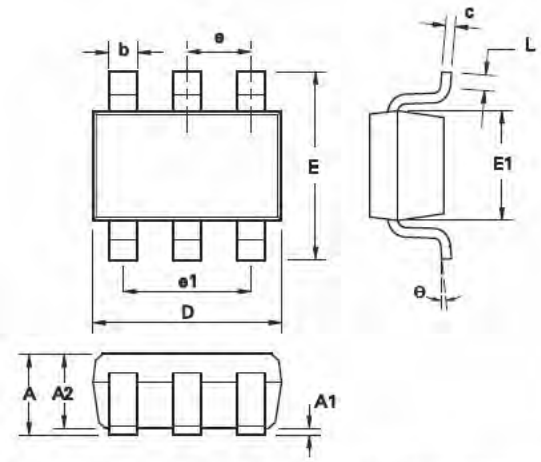
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	50			V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 8)	$V_{(BR)CEO}$	50			V	I_C = 10mA
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5			V	I_E = 100µA
Collector-Base Cutoff Current	I_{CBO}			10	nA	V_{CB} = 40V
Collector-Emitter Cutoff Current	I_{CES}			10	nA	V_{CES} = 40V
Emitter Cutoff Current	I_{EBO}			10	nA	V_{EB} = 4V
DC Current Gain (Note 8)	h_{FE}	200 300 200 75 20	420 450 350 130 60			I_C = 10mA, V_{CE} = 2V I_C = 100mA, V_{CE} = 2V I_C = 500mA, V_{CE} = 2V I_C = 1A, V_{CE} = 2V I_C = 1.5A, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Note 8)	$V_{CE(SAT)}$		24 60 120 160	35 80 200 270	mV mV mV mV	I_C = 100mA, I_B = 10mA I_C = 250mA, I_B = 10mA I_C = 500mA, I_B = 10mA I_C = 1A, I_B = 50mA
Base-Emitter Saturation Voltage (Note 8)	$V_{BE(sat)}$		940	1100	mV	I_C = 1A, I_B = 50mA
Base-Emitter Turn-On Voltage (Note 8)	$V_{BE(ON)}$		850	1100	mV	I_C = 1A, V_{CE} = 2V
Output Capacitance	C_{obo}		10		pF	V_{CB} = 10V. f = 1MHz
Current Gain-Bandwidth Product	f_T		215		MHz	V_{CE} = 10V, I_C = 50mA f = 100MHz
Turn-On Time	t_{on}		150		ns	V_{CC} = 10V, I_C = 1A I_{B1} = -I_{B2} = 100mA
Turn-Off Time	t_{off}		425		ns	

Notes: 8. Measured under pulsed conditions. Pulse width ≤ 300 µs. Duty cycle ≤ 2%

Typical Characteristics



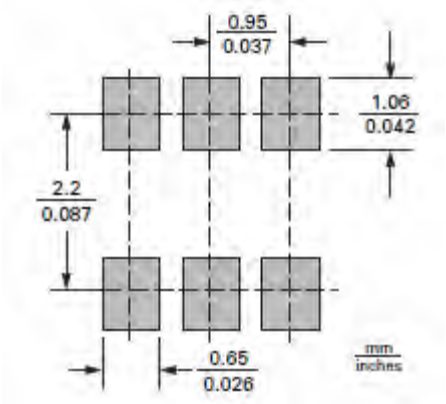
Package Outline Dimensions



DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.45	0.0354	0.0570
A1	0.00	0.15	0.00	0.0059
A2	0.90	1.30	0.0354	0.0511
b	0.35	0.50	0.0078	0.0196
C	0.09	0.26	0.0035	0.0102
D	2.70	3.10	0.1062	0.1220
E	2.20	3.20	0.0866	0.1181
E1	1.30	1.80	0.0511	0.0708
L	0.10	0.60	0.0039	0.0236
e	0.95 REF		0.0374 REF	
e1	1.90 REF		0.0748 REF	
L	0°	30°	0°	30°

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

Suggested Pad Layout



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