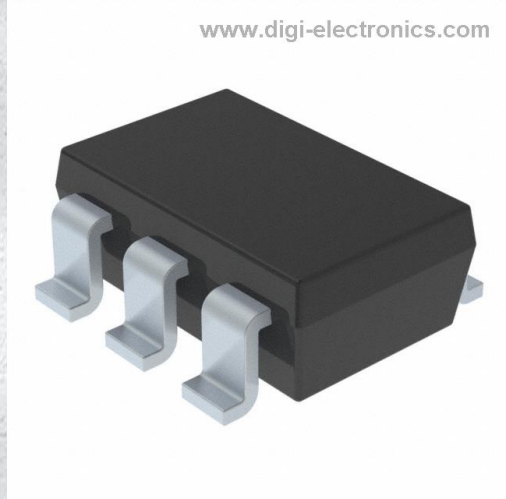
ZXTC2045E6TA Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	ZXTC2045E6TA-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	ZXTC2045E6TA
Description	TRANS NPN/PNP 30V 1.5A SOT23-6
Detailed Description	Bipolar (BJT) Transistor Array 1 NPN, 1 PNP 30V 1.5A 1.1W Surface Mount SOT-26

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
ZXTC2045E6TA	Diodes Incorporated
Series:	Product Status:
-	Active
Transistor Type:	Current - Collector (Ic) (Max):
1 NPN, 1 PNP	1.5A
Voltage - Collector Emitter Breakdown (Max):	Vce Saturation (Max) @ Ib, Ic:
30V	375mV @ 15mA, 750mA
Current - Collector Cutoff (Max):	DC Current Gain (hFE) (Min) @ Ic, Vce:
20nA	180 @ 100mA, 2V
Power - Max:	Frequency - Transition:
1.1W	-
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Package / Case:	Supplier Device Package:
SOT-23-6	SOT-26
Base Product Number:	
ZXTC2045	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.29.0075	

A Product Line of
Diodes Incorporated

Lead-free Green

ZXTC2045E6

30V COMPLEMENTARY MEDIUM POWER TRANSISTOR IN SOT26

Features

- NPN + PNP Combination
- BV_{CEO} > 30 (-30)V
- BV_{CEV} > 40 (-40)V
- I_{CM} = 5 (-5)A Peak Pulse Current
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

Mechanical Data

- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.015 grams (Approximate)

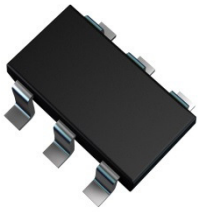
Description

Advanced process capability is used to achieve this high performance device. Combining NPN and PNP transistors, the SOT26 package provides a compact solution for the intended applications.

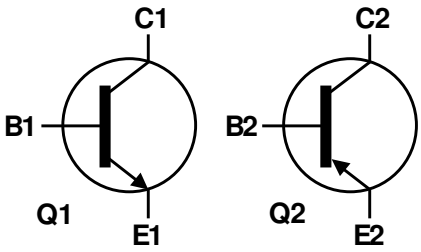
Applications

- MOSFET and IGBT Gate Driving
- Motor Drive

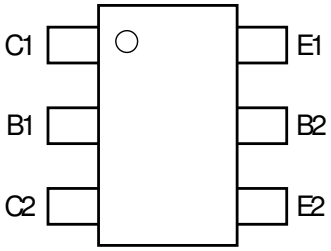
SOT26



Top View



Device Symbol



Top View
Pin-Out

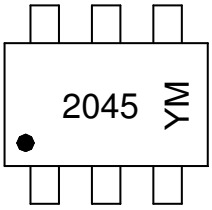
Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTC2045E6TA	AEC-Q101	2045	7	8	3,000
ZXTC2045E6QTA	Automotive	2045	7	8	3,000

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/ for more information about Diodes Incorporated's definitions of Halogen and Antimony free, "Green" and Lead-Free.
3. Halogen and Antimony free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. Automotive products are AEC-Q101 qualified and PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified.
5. For packaging details, go to our website at http://www.diodes.com

Marking Information

SOT26



2045 = Product Type Marking Code
YM = Date Code Marking
Y or $\overline{Y}$ = Year (ex: C = 2015)
M or $\overline{M}$ = Month (ex: 9 = September)

Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Code	C	D	E	F	G	H	I	J	K	L	M

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Absolute Maximum Ratings – Q1 (NPN Transistor) (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	40	V
Collector-Emitter Voltage	V_{CEV}	40	V
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	1.5	A
Peak Pulsed Collector Current	I_{CM}	5	A
Base Current	I_B	1	A

Absolute Maximum Ratings – Q2 (PNP Transistor) (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-40	V
Collector-Emitter Voltage	V_{CEV}	-40	V
Collector-Emitter Voltage	V_{CEO}	-30	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-1.5	A
Peak Pulsed Collector Current	I_{CM}	-5	A
Base Current	I_B	-1	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

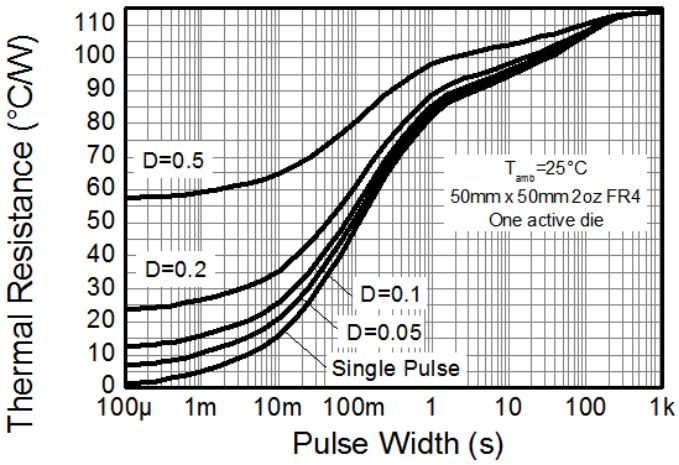
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Notes 6 & 10)	P_D	0.7 5.6	W mW/°C
	(Notes 7 & 10)		0.9 7.2	
	(Notes 7 & 11)		1.1 8.8	
	(Notes 8 & 10)		1.1 8.8	
	(Notes 9 & 10)		1.7 13.6	
Thermal Resistance, Junction to Ambient	(Notes 6 & 10)	$R_{\theta JA}$	179	°C/W
	(Notes 7 & 10)		139	
	(Notes 7 & 11)		113	
	(Notes 8 & 10)		113	
	(Notes 9 & 10)		73	
Thermal Resistance, Junction to Lead	(Note 12)	$R_{\theta JL}$	95.50	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 13)

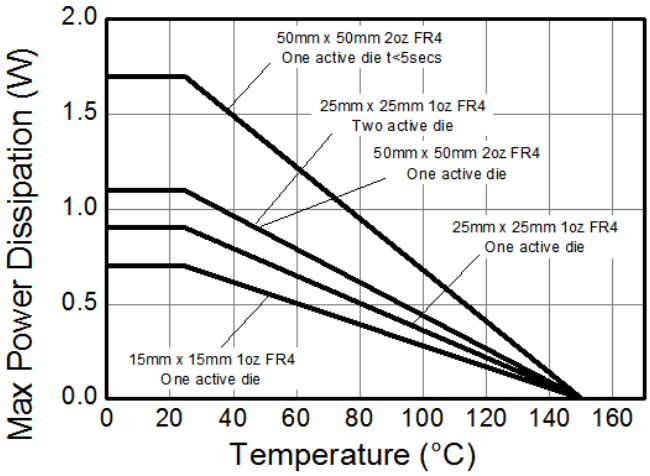
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
6. For a device surface mounted on 15mm x 15mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
7. Same as Note 6, except the device is surface mounted on 25mm x 25mm 1oz copper.
8. Same as Note 6, except the device is surface mounted on 50mm x 50mm 2oz copper.
9. Same as Note 8, except the device is measured at t < 5 seconds.
10. For device with one active die, both collectors attached to a common heatsink.
11. For device with two active die running at equal power, split heatsink 50% to each collector.
12. Thermal resistance from junction to solder-point (at the end of the collector lead).
13. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

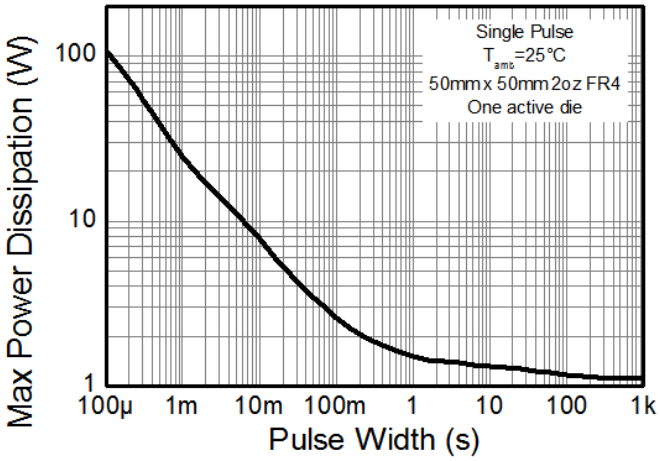
Thermal Characteristics and Derating Information



Transient Thermal Impedance



Derating Curve



Pulse Power Dissipation

Electrical Characteristics – Q1 (NPN Transistor) (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	40	-	—	V	I_C = 100µA, I_E = 0
Collector-Emitter Breakdown Voltage	BV_{CEV}	40	-	—	V	I_C = 1µA, 0.25V > V_{BE} > 1.0V
Collector-Emitter Breakdown Voltage (Note 14)	BV_{CEO}	30	-	—	V	I_C = 10mA, I_B = 0
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.3	—	V	I_E = 100µA, I_C = 0
Collector Cut-Off Current	I_{CBO}	—	<1	20	nA	V_{CB} = 32V
Collector Cut-Off Current	$I_{CES/R}$	—	<1	20	nA	V_{CE} = 16V, R ≤ 1kΩ
Emitter Cut-Off Current	I_{EBO}	—	<1	20	nA	V_{EB} = 6V
ON CHARACTERISTICS (Note 14)						
DC Current Gain	h_{FE}	180	300	500	—	I_C = 100mA, V_{CE} = 2V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	375	mV	I_C = 750mA, I_B = 15mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	1,200	mV	I_C = 750mA, I_B = 15mA
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	—	9	20	pF	V_{CB} = 10V, f = 1.0MHz
Current Gain-Bandwidth Product	f_T	—	265	—	MHz	V_{CE} = 10V, I_C = 50mA, f = 100MHz
Delay Time	t_d	—	10	—	ns	V_{CC} = 10V, I_C = 1A I_{B1} = -I_{B2} = 50mA
Rise Time	t_r	—	12	—	ns	
Storage Time	t_s	—	185	—	ns	
Fall Time	t_f	—	45	—	ns	

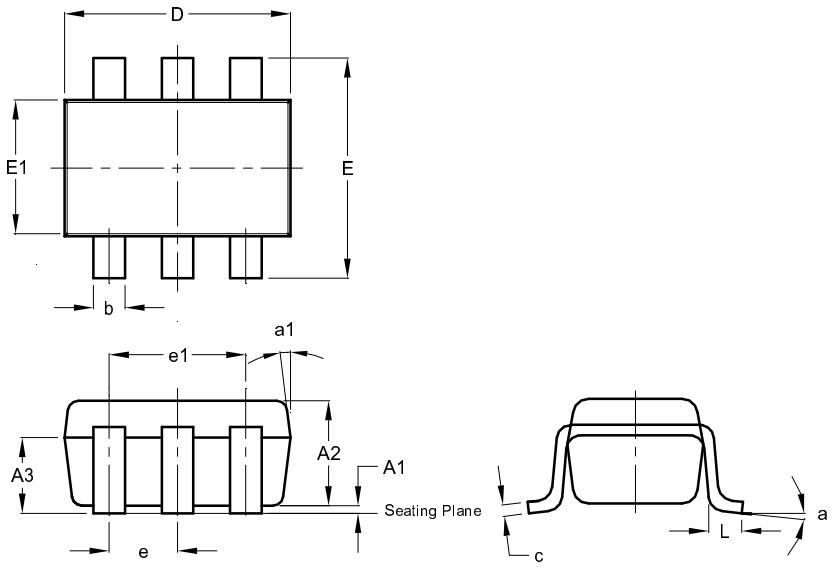
Electrical Characteristics – Q2 (PNP Transistor) (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	-40	-	—	V	I_C = -100µA, I_E = 0
Collector-Emitter Breakdown Voltage	BV_{CEV}	-40	-	—	V	I_C = -1µA, 0.25V < V_{BE} < 1.0V
Collector-Emitter Breakdown Voltage (Note 14)	BV_{CEO}	-30	-	—	V	I_C = -10mA, I_B = 0
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.3	—	V	I_E = -100µA, I_C = 0
Collector Cut-Off Current	I_{CBO}	—	<-1	-20	nA	V_{CB} = -32V
Collector Cut-Off Current	$I_{CES/R}$	—	<-1	-20	nA	V_{CE} = -16V, R ≤ 1kΩ
Emitter Cut-Off Current	I_{EBO}	—	<-1	-20	nA	V_{EB} = -6V
ON CHARACTERISTICS (Note 14)						
DC Current Gain	h_{FE}	180	300	500	—	I_C = -100mA, V_{CE} = -2V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	-375	mV	I_C = -750mA, I_B = -15mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	—	-1,200	mV	I_C = -750mA, I_B = -15mA
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{obo}	—	9	20	pF	V_{CB} = -10V, f = 1.0MHz
Current Gain-Bandwidth Product	f_T	—	195	—	MHz	V_{CE} = -10V, I_C = -50mA, f = 100MHz
Delay Time	t_d	—	16	—	ns	V_{CC} = -10V, I_C = -1A I_{B1} = -I_{B2} = -50mA
Rise Time	t_r	—	11	—	ns	
Storage Time	t_s	—	220	—	ns	
Fall Time	t_f	—	31	—	ns	

Note: 14. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

Package Outline Dimensions

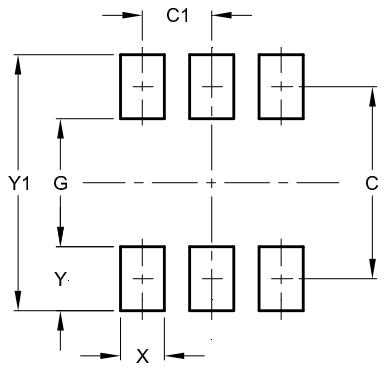
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT26			
Dim	**Min**	**Max**	**Typ**
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



Dimensions	Value (in mm)
C	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20

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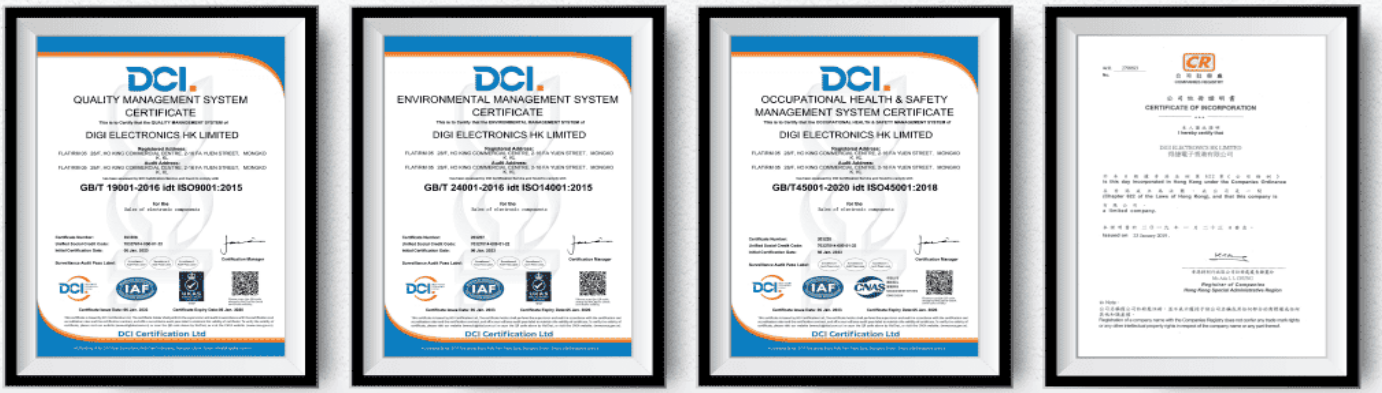

Tel: +00 852-30501935

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