

40V NPN MEDIUM POWER PLANAR TRANSISTOR IN SOT23

Features

- $BV_{CEO} > 40V$
- $I_C = 1A$ Continuous Collector Current
- Low Saturation Voltage $V_{CE(sat)} < 500mV @ 1A$
- Complementary Part Number ZXTP2041F
- **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**

Mechanical Data

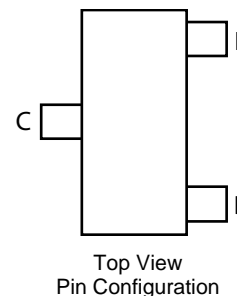
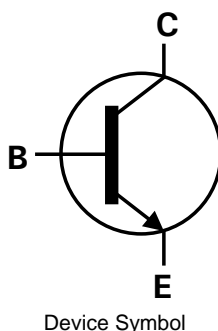
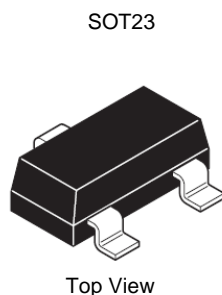
- Case: SOT23
- Case material: Molded Plastic. "Green" Molding Compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish; Solderable per MIL-STD-202, Method 208 **(e3)**
- Weight: 0.008 grams (Approximate)

Description

This transistor combines high gain, high current operation and low saturation voltage making it ideal for power MOSFET gate driving and low loss power switching.

Applications

- Power MOSFET gate driving
- Low loss power switching

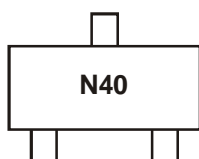


Ordering Information (Note 4)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN2040FTA	N40	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. For packaging details, go to our website at <http://www.diodes.com>.

Marking Information



N40 = Product Type Marking Code

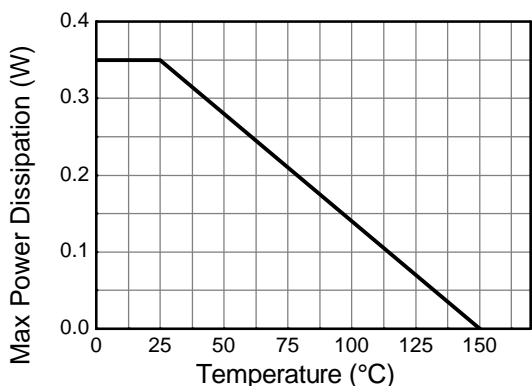
Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	40	V
Collector-Emitter Voltage	V _{CEO}	40	V
Emitter-Base Voltage	V _{EBO}	6	V
Continuous Collector Current (Note 5)	I _C	1	A
Peak Pulse Current	I _{CM}	2	A
Peak Base Current	I _{BM}	1	A

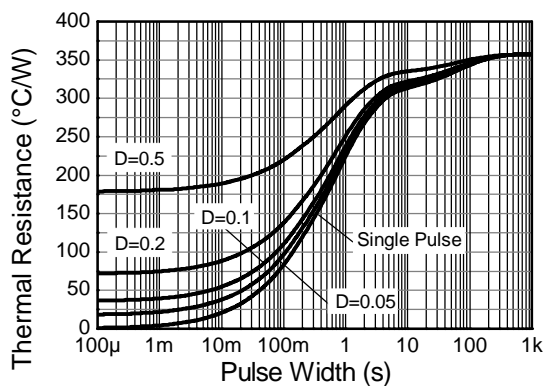
Thermal Characteristics

Characteristic	Symbol	Value	Unit
Collector Power Dissipation	P _D	(Note 5)	310
		(Note 6)	350
Thermal Resistance, Junction to Ambient	R _{θJA}	(Note 5)	403
		(Note 6)	357
Thermal Resistance, Junction to Leads	R _{θJL}	350	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

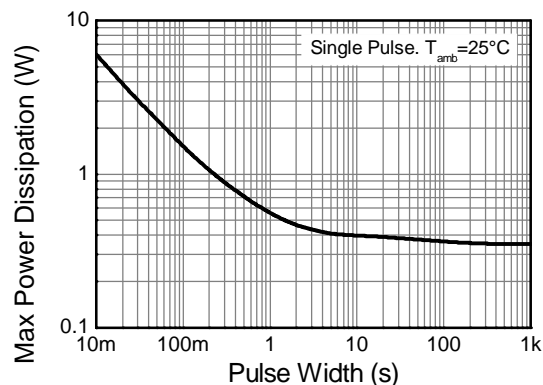
- Notes: 5. For the device mounted on minimum recommended pad layout FR4 PCB with high coverage of single sided 1oz copper in still air condition.
 6. Same as Note 5, expect the device is mounted on 15mm X 15mm X 1.6mm FR4 PCB.
 7. Thermal resistance from junction to solder-point (at the end of the collector lead).



Derating Curve



Transient Thermal Impedance



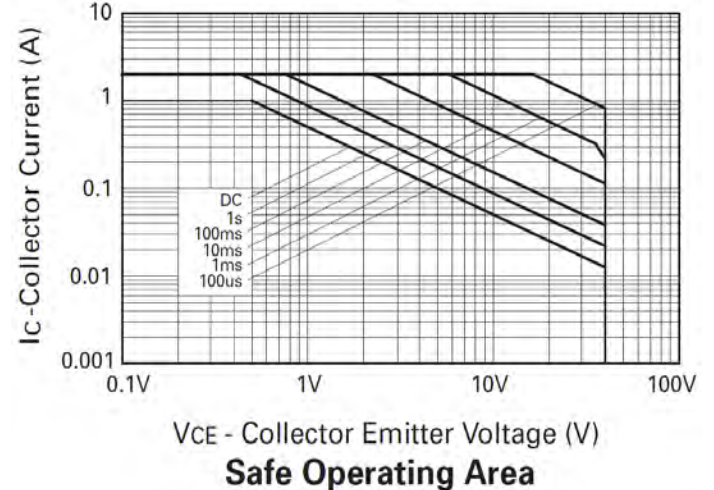
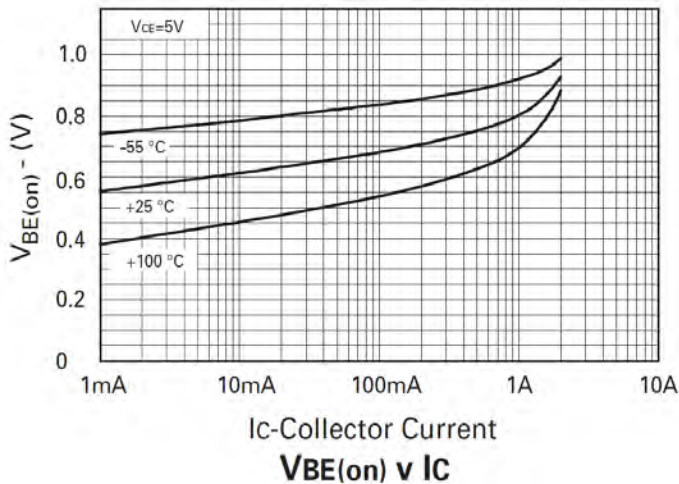
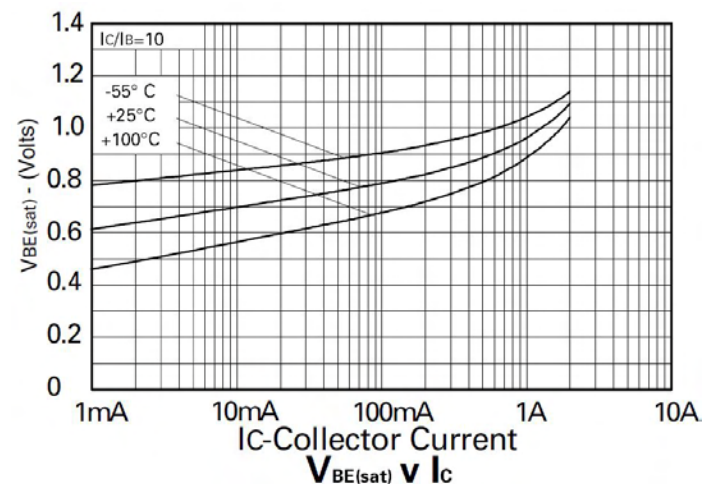
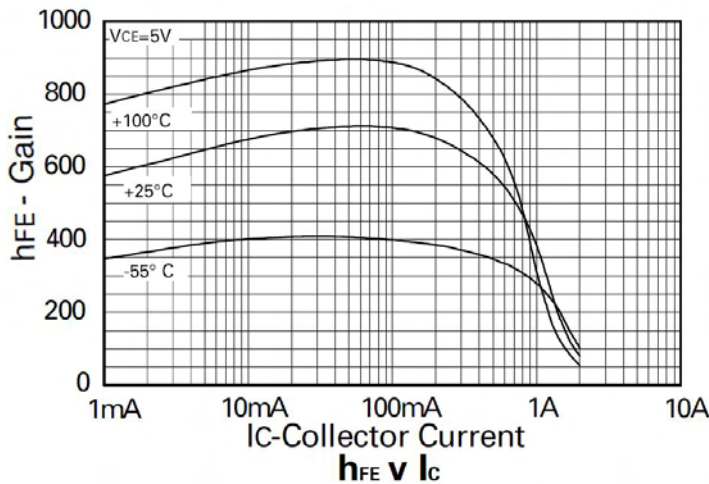
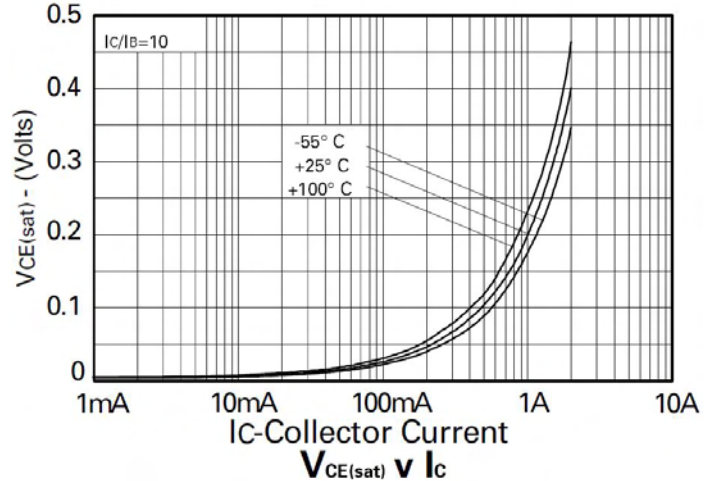
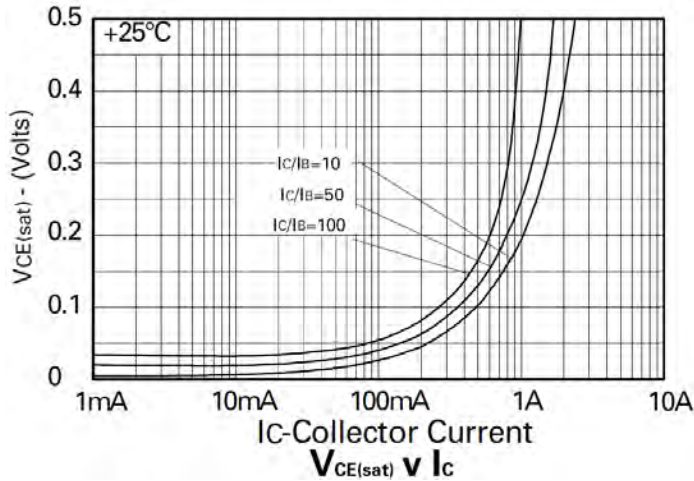
Pulse Power Dissipation

Electrical Characteristics (@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
Collector-Emitter Breakdown Voltage (base open) (Note 8)	BV _{CEO}	40	—	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	6	—	—	V	I _E = 100μA
Collector-emitter cut-off current	I _{CES}	—	—	100	nA	V _{CE} = 30V
Collector-base Cut-off Current	I _{CB0}	—	—	100	nA	V _{CB} = 30V
Emitter-base Cut-off Current	I _{EBO}	—	—	100	nA	V _{EB} = 5V
ON CHARACTERISTICS (Note 8)						
Static Forward Current Transfer Ratio	h _{FE}	300 300 200 35	—	— 900 — —	—	I _C = 1mA, V _{CE} = 5V I _C = 500mA, V _{CE} = 5V I _C = 1A, V _{CE} = 5V I _C = 2A, V _{CE} = 5V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	—	—	200 300 500	mV	I _C = 100mA, I _B = 1mA I _C = 500mA, I _B = 50mA I _C = 1A, I _B = 100mA
Base-Emitter Saturation Voltage	V _{BE(sat)}	—	—	1.1	V	I _C = 1A, I _B = 100mA
Base-Emitter On Voltage	V _{BE(on)}	—	—	1.0	V	I _C = 1A, V _{CE} = 5V
SMALL SIGNAL CHARACTERISTICS (Note 8)						
Transition Frequency	f _T	150	—	—	MHz	I _C = 50mA, V _{CE} = 10V, f = 100MHz
Output Capacitance	C _{obo}	—	—	10	pF	V _{CB} = 10V, f = 1MHz

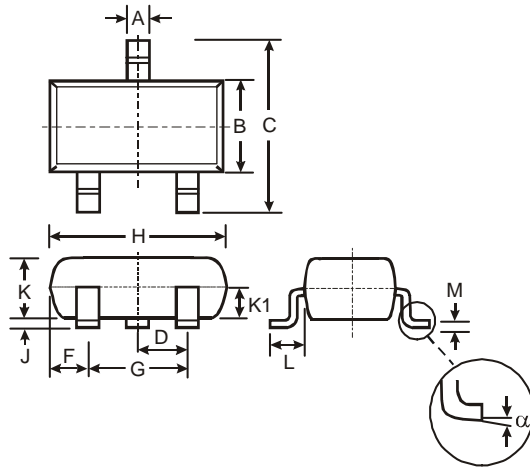
Notes: 8. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%

Typical Electrical Characteristics



Package Outline Dimensions

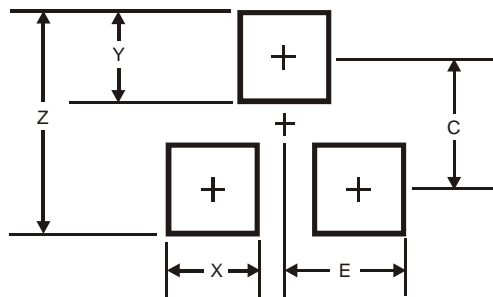
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-
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)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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