

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

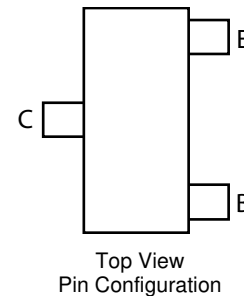
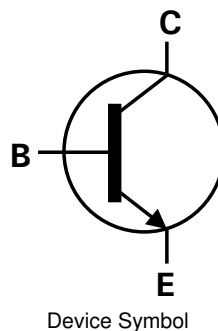
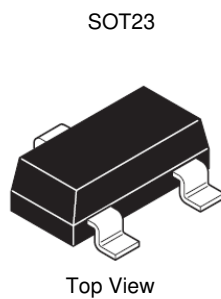
- Case: SOT23
- Case material: Molded Plastic. "Green" Molding Compound
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish; Solderable per MIL-STD-202, Method 208
- Weight: 0.008 grams (Approximate)

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

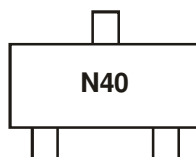


Ordering Information (Note 4)

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

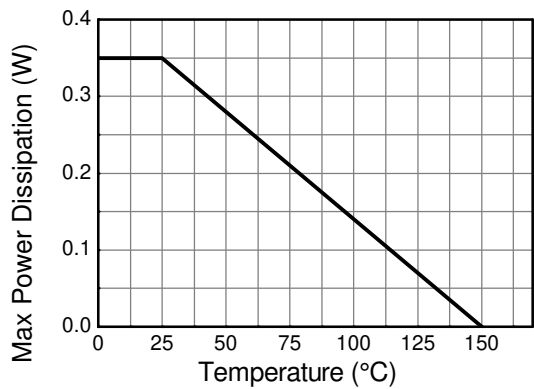
Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

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

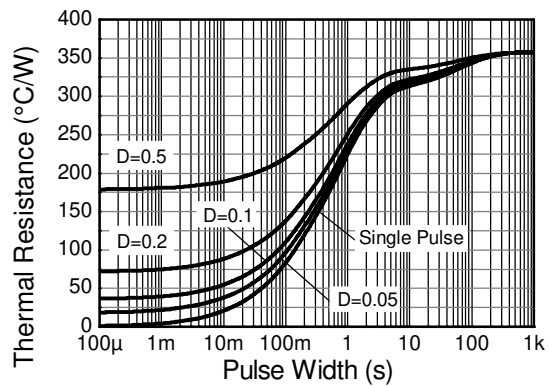
Thermal Characteristics

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

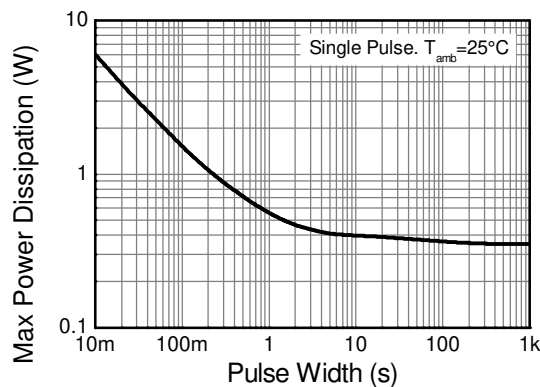
- Notes:
- 5. For the device mounted on minimum recommended pad layout FR4 PCB with high coverage of single sided 1oz copper in still air condition.
 - 6. Same as Note 5, expect the device is mounted on 15mm X 15mm X 1.6mm FR4 PCB.
 - 7. Thermal resistance from junction to solder-point (at the end of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



Derating Curve



Transient Thermal Impedance



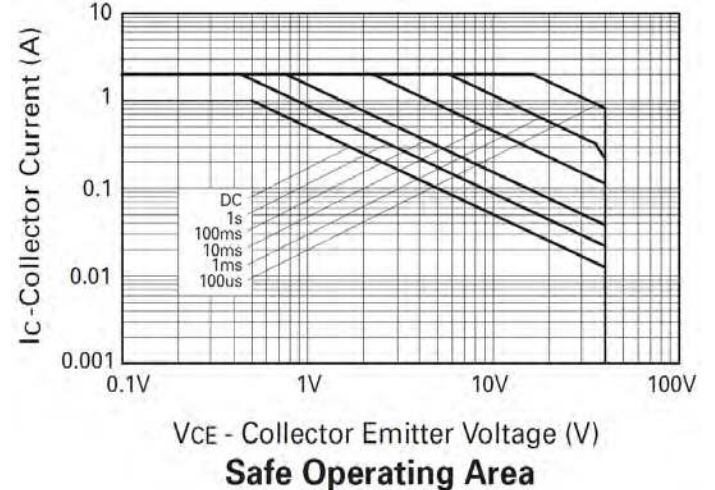
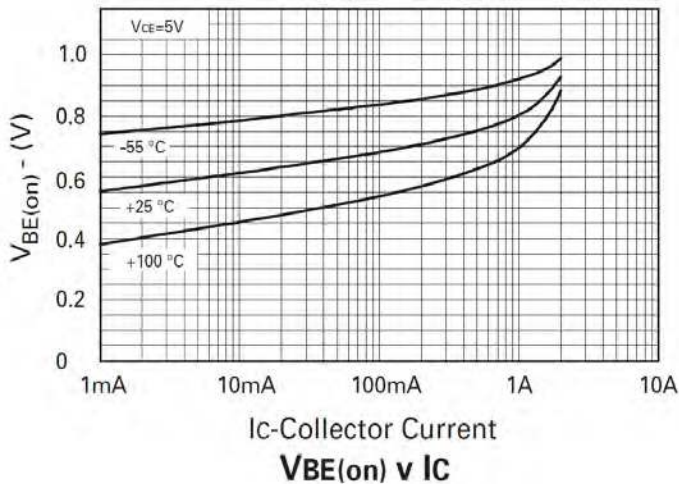
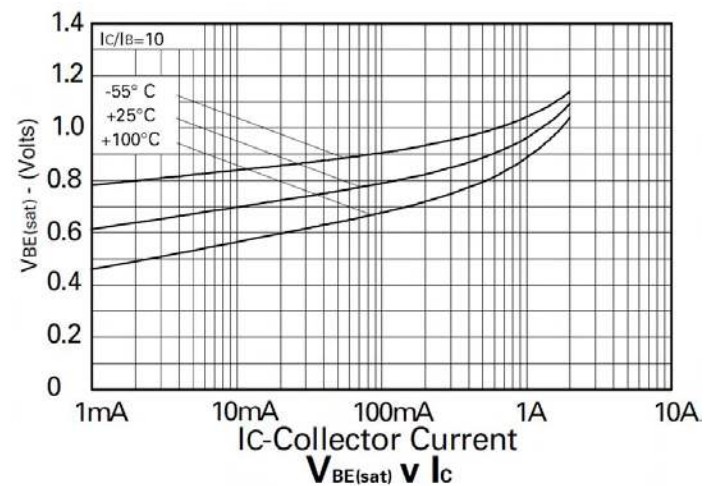
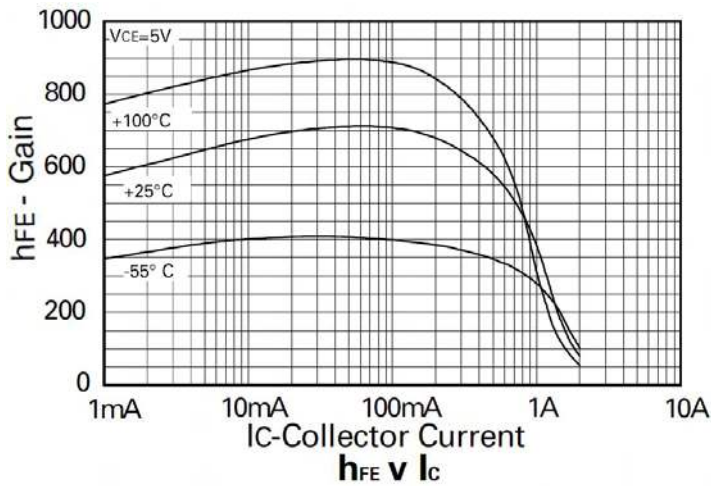
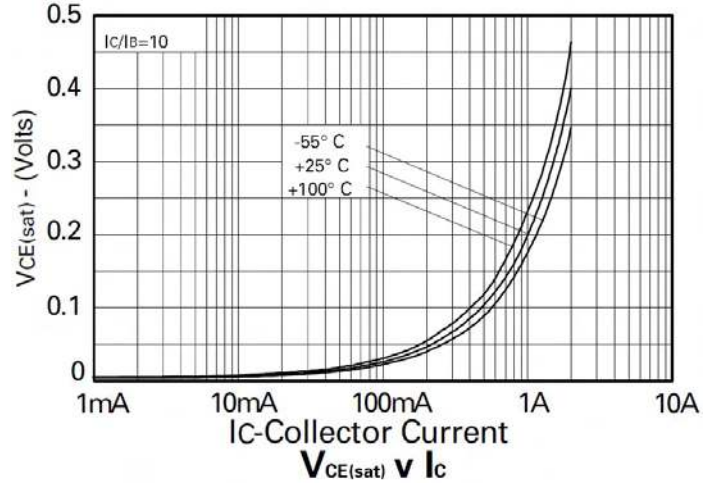
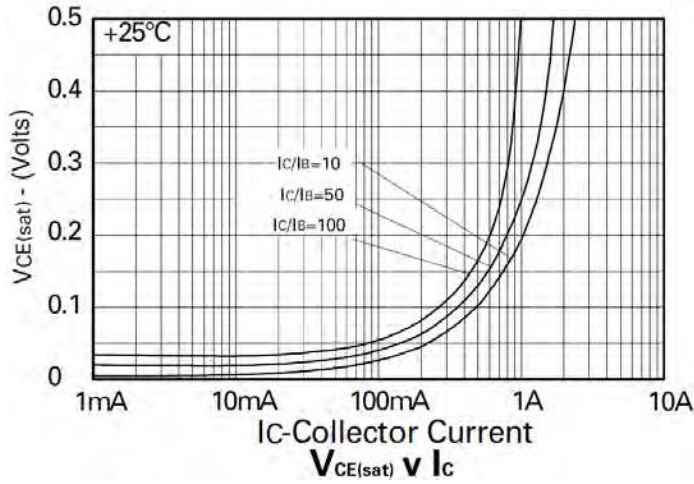
Pulse Power Dissipation

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 _{CBO}	—	—	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

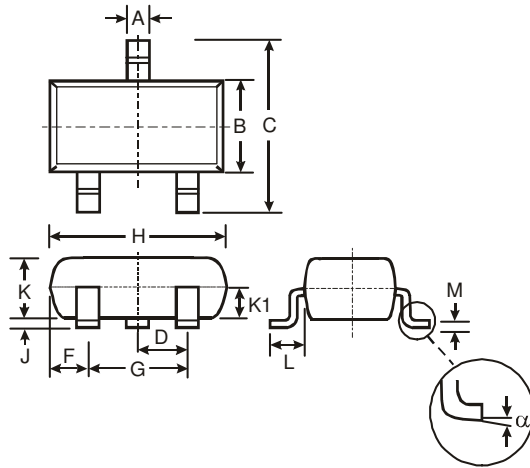
Notes: 8. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%

Typical Electrical Characteristics



Package Outline Dimensions

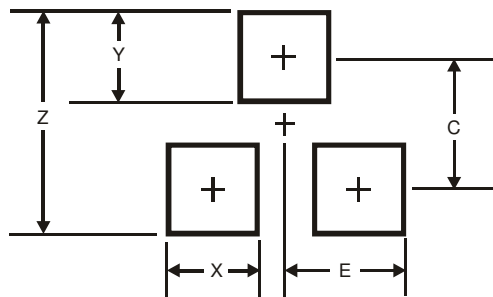
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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