

40V PNP LOW SATURATION TRANSISTOR IN SOT23

Description

This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirement of automotive applications.

Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 2086 @3
- Weight: 0.008 grams (Approximate)

Features

- $BV_{CEO} > -40V$
- $BV_{ECO} > -3V$
- Maximum Continuous Collector Current I_C = -3A
- $R_{CE(sat)} = 55m\Omega$
- V_{CE(sat)} < -85mV @ -1A
- High Power Dissipation SOT23 Package
- High Peak Current
- Low Saturation Voltage
- -3V Reverse Blocking Voltage
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen- and Antimony-Free. "Green" Device (Note 3)
- The ZTP25040DFHQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.

https://www.diodes.com/quality/product-definitions/

Applications

- MOSFET and IGBT Gate Driving
- DC DC Converters
- Motor Drives
- High-Side Drivers

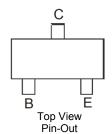
SOT23 (Type



Top View



Device Symbol



Ordering Information (Note 4)

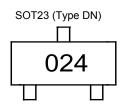
Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ZTP25040DFHQTA	Automotive	024	7	8	3,000

Notes:

- 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
- 2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and
- 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 https://www.diodes.com/design/support/packaging/diodes-packaging/



Marking Information



024 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	-45	V
Collector-Emitter Voltage	V _{CEO}	-40	V
Emitter-Collector Voltage	V _{ECO}	-3	V
Emitter-Base Voltage	V _{EBO}	-7	V
Continuous Collector Current	Ic	-3	Α
Peak Pulse Current	I _{CM}	-9	A

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

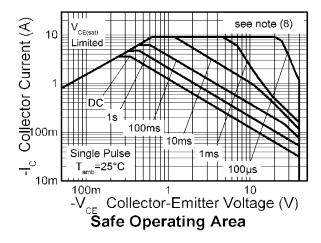
Characteristic		Symbol	Value	Unit	
	(Note 5)		0.73 5.84		
Power Dissipation	(Note 6)	D	1.05 8.4	W mW/°C	
Linear Derating Factor	(Note 7)	P_D	1.25 9.6		
	(Note 8)		1.81 14.5		
	(Note 5)		171	°C/W	
The word Designation of Ameliant	(Note 6)	Б	119		
Thermal Resistance, Junction to Ambient	(Note 7)	$R_{ heta JA}$	100		
	(Note 8)		69		
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C	

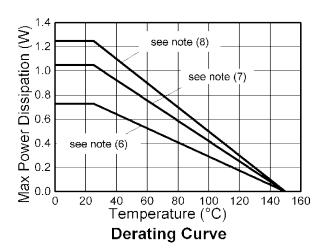
Notes:

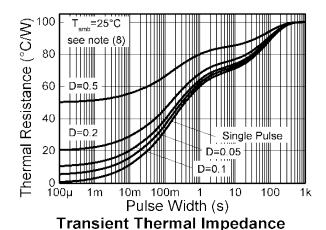
- 5. For a device mounted with the collector lead on 15mm × 15mm 1oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in steady-state.
- $6. \ Mounted \ on \ 25mm \times 25mm \ 1.6mm \ FR-4 \ PCB \ with \ a \ high \ coverage \ of \ single \ sided \ 2oz \ copper \ in \ still \ air \ conditions.$
- 7. Mounted on 50mm × 50mm 1.6mm FR-4 PCB with a high coverage of single sided 2oz copper in still air conditions.
- 8. Same as note (7), except measured at t < 5 seconds.

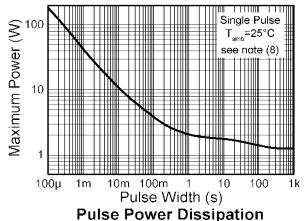


Thermal Characteristics (@ T_A = +25°C, unless otherwise specified.)











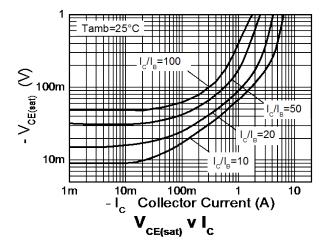
Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)

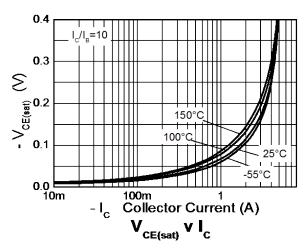
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-45	-75	_	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	-40	-65	_	V	I _C = -10mA
Collector-Emitter Breakdown Voltage	BV _{ECO}	-3	-8.7	_	V	I _E = -100μA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8.2	_	V	I _E = -100μA
Collector-Base Cutoff Current	Ісво	_	< -1	-50	nA	V _{CB} = -45V
Collector-Base Cutoff Current		_	_	-0.5	μA	V _{CB} = -45V, T _{amb} = 100°C
Emitter-Base Cutoff Current	I _{EBO}	_	<-1	-50	nA	V _{EB} = -5.6V
		300	450	900		I _C = -10mA, V _{CE} = -2V
Static Forward Current Transfer Ratio (Note 9)	h _{FE}	200	300	_		I _C = -1A, V _{CE} = -2V
		30	60	_		I _C = -3A, V _{CE} = -2V
	V _{CE(sat)}	_	-170	-260		I _C = -1A, I _B = -20mA
Collector-Emitter Saturation Voltage (Note 9)		_	-65	-85		I _C = -1A, I _B = -100mA
		_	-165	-220		$I_C = -3A$, $I_B = -300mA$
Base-Emitter Saturation Voltage (Note 9)	V _{BE(sat)}	_	-930	-1000	mV	I _C = -3A, I _B = -300mA
Base-Emitter Saturation Voltage (Note 9)	V _{BE(on)}	_	-830	-900	mV	I _C = -3A, V _{CE} = -2V
Output Capacitance (Note 9)	C _{obo}	_	17.4	_	pF	V _{CB} = -10V, f = 1MHz
Transition Frequency	f _T	_	270	_	MHz	V _{CE} = -10V, I _C = -50mA, f = 100MHz
Turn-On Time	t _{on}	_	75.5	_	ns	$V_{CC} = -15V, I_{C} = -750mA,$
Turn-Off Time	t _{off}	_	320	_	115	$I_{B1} = -I_{B2} = -15mA$

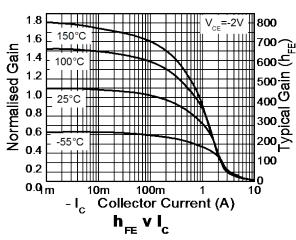
Note: 9. Measured under pulsed conditions. Pulse width \leq 300 μ s. Duty cycle \leq 2%.

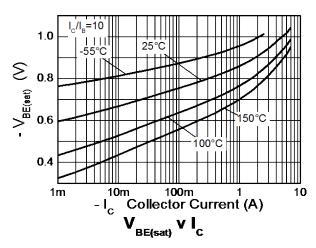


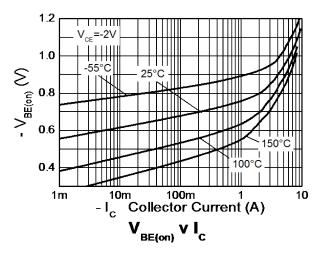
Typical Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)







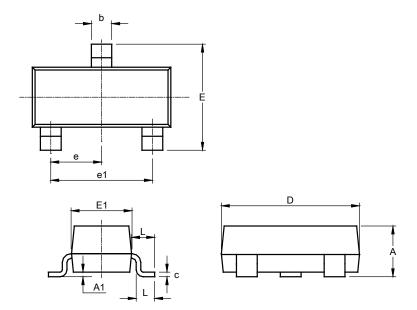






Package Outline Dimensions

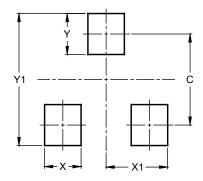
Please see http://www.diodes.com/package-outlines.html for the latest version.



SOT23 (Type DN)					
Dim	Min	Max	Тур		
Α	0.89	1.12	1.00		
A1	0.01	0.10	0.05		
b	0.30	0.51	0.45		
С	0.08	0.20	0.10		
D	2.80	3.04	3.00		
Е	2.10	2.64	2.42		
E1	1.20	1.40	1.37		
е	0.95 REF				
e1	1.90 REF				
L	0.25	0.60	0.30		
L1	0.45	0.62	0.54		
All Dimensions in mm					

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.



Dimensions	Value (in mm)
С	2.0
X	0.8
X1	1.35
Υ	0.9
Y1	2.9



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