ANTREX Electronics

Electronic Components Sourcing Information

Product Reference Information

Part Number:	ZTN23015CFHQTA
Manufacturer:	Diodes Incorporated
Package:	TO-236-3, SC-59, SOT-23-3
Availability:	Please confirm with sales

Product Page:

https://antrexco.com/product/details/diodes-incorporated/ztn23015cfhqta.html

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Note:

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

15V NPN MEDIUM POWER 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 e3
- Weight: 0.008 grams (Approximate)

Features

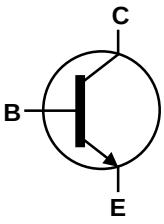
- BV_{CEO} > 15V
- Maximum Continuous Collector Current I_C = 6A
- $V_{CE(SAT)}$ < 30mV @ 1A
- $R_{CE(SAT)}$ = 19mΩ Typical
- High Power Dissipation SOT23 Package
- High Peak Current
- Low Saturation Voltage
- 60V Forward Blocking Voltage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen- and Antimony-Free. “Green” Device (Note 3)**
- **The ZTN23015CFHQ 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

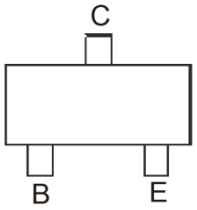
- DC - DC Converters
- MOSFET and IGBT Gate Driving
- Motor Drive
- Relay, Lamp and Solenoid Drive

SOT23 (Type DN)

Top View



Device Symbol



Top View
Pin-Out

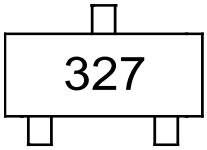
Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ZTN23015CFHQTA	Automotive	327	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

SOT23 (Type DN)



327 = Product Type Marking Code

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

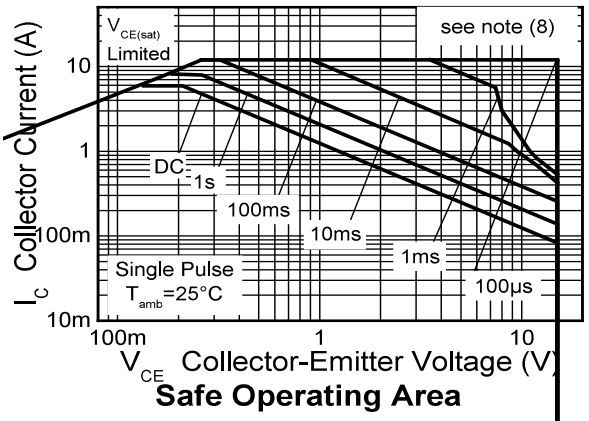
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEV}	60	V
Collector-Emitter Voltage	V_{CEO}	15	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	6	A
Base Current	I_B	1.2	A
Peak Pulse Current	I_{CM}	12	A

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

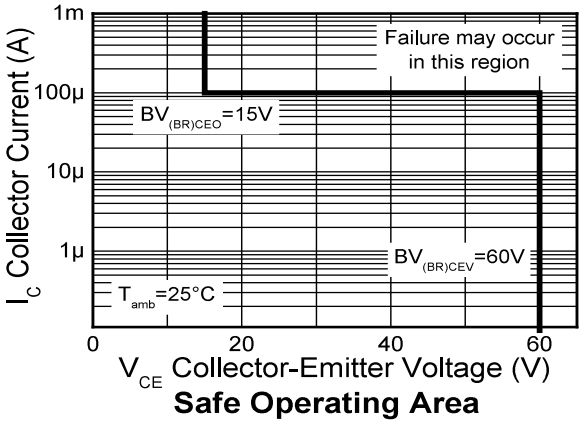
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 6)	P_D	0.73 5.84	W mW/°C
	(Note 7)		1.05 8.4	
	(Note 8)		1.25 9.6	
	(Note 9)		1.81 14.5	
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	171	°C/W
	(Note 7)		119	
	(Note 8)		100	
	(Note 9)		69	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes:
6. 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.
7. Mounted on 25mm × 25mm 1.6mm FR-4 PCB with a high coverage of single sided 2oz copper in still air conditions.
8. Mounted on 50mm × 50mm 1.6mm FR-4 PCB with a high coverage of single sided 2oz copper in still air conditions.
9. Same as note (8), except measured at t < 5 seconds.

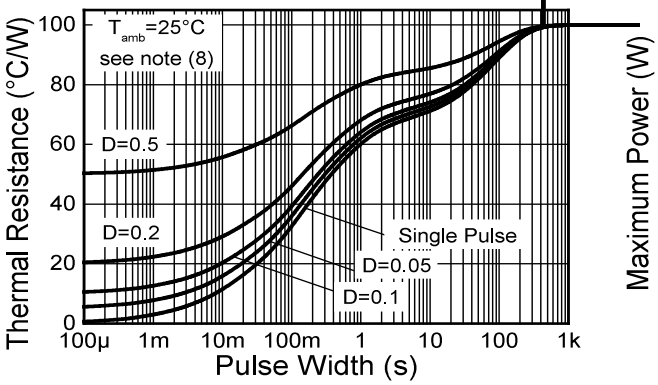
Thermal Characteristics (@ T_A = +25°C, unless otherwise specified.)



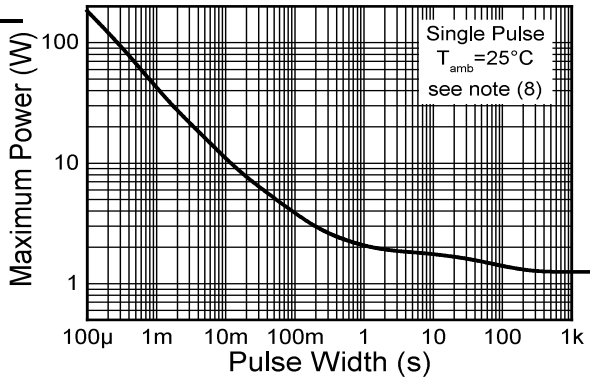
Safe Operating Area



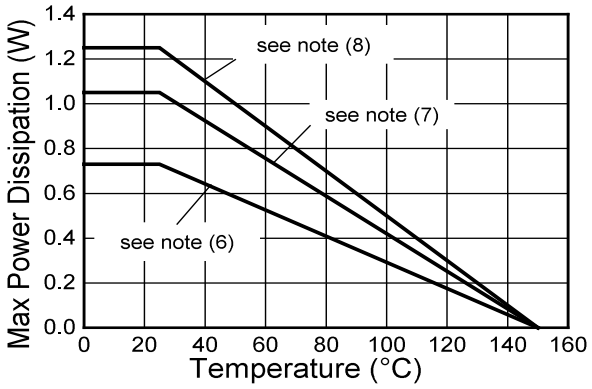
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



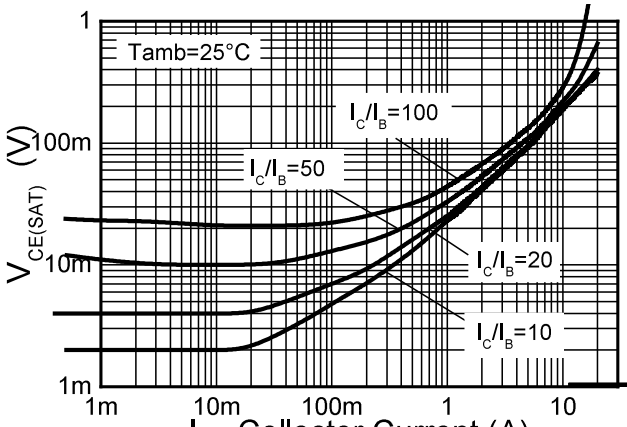
Derating Curve

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

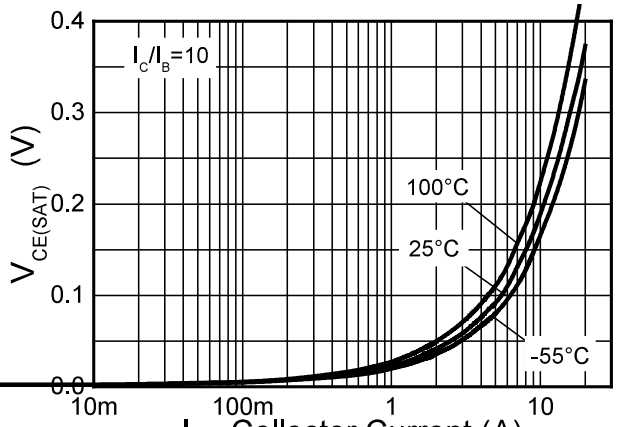
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	60	85	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage	BV_{CEV}	60	85	—	V	I_C = 100µA, $R_{BE} \leq$ 1kΩ or -1V < V_{BE} < 0.25V
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	15	23	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.3	—	V	I_E = 100µA
Collector-Base Cutoff Current	I_{CBO}	—	< 1	20	nA	V_{CB} = 48V
Collector-Emitter Cutoff Current	I_{CEV}	—	—	100	nA	V_{CE} = 48V, $R_{BE} \leq$ 1kΩ or -1V < V_{BE} < 0.25V
Emitter-Base Cutoff Current	I_{EBO}	—	< 1	10	nA	V_{EB} = 6V
Static Forward Current Transfer Ratio (Note 10)	h_{FE}	160	300	—	—	I_C = 10mA, V_{CE} = 2V
		200	350	560		I_C = 500mA, V_{CE} = 2V
		190	330	—		I_C = 3A, V_{CE} = 2V
		150	280	—		I_C = 6A, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	—	7	15	mV	I_C = 0.1A, I_B = 5mA
		—	22	30		I_C = 1A, I_B = 100mA
		—	70	90		I_C = 3A, I_B = 60mA
		—	130	180		I_C = 6A, I_B = 120mA
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(sat)}$	—	0.83	0.93	V	I_C = 3A, I_B = 60mA
		—	0.89	0.98		I_C = 6A, I_B = 120mA
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(on)}$	—	0.81	0.91	V	I_C = 6A, V_{CE} = 2V
Output Capacitance	C_{OBO}	—	56	—	pF	V_{CB} = 10V, f = 1MHz
Transition Frequency	f_T	—	235	—	MHz	V_{CE} = 2V, I_C = 500mA, f = 50MHz
Delay Time	t_d	—	15	—	ns	V_{CC} = 5V, I_C = 3A, I_{B1} = -I_{B2} = 150mA
Rise Time	t_r	—	38.5	—		
Storage Time	t_{stg}	—	213	—		
Fall Time	t_f	—	19.7	—		

Note: 10. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

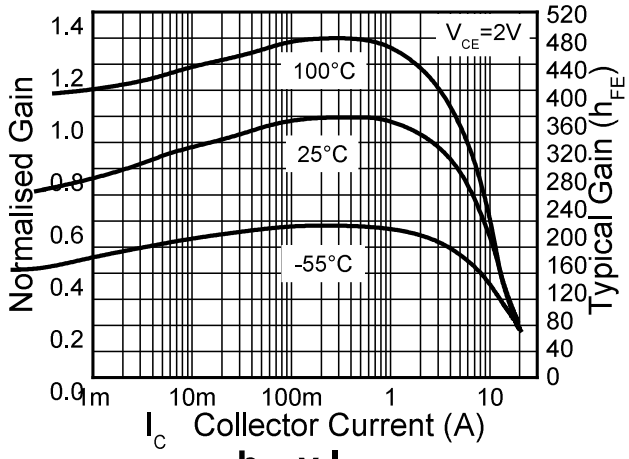
Typical Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)



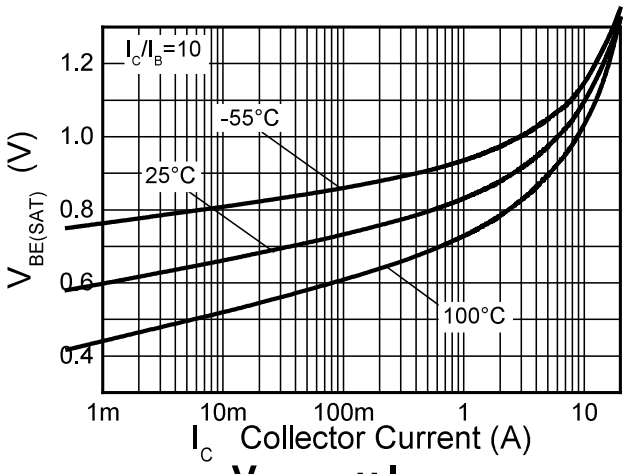
$V_{CE(SAT)}$ v I_C



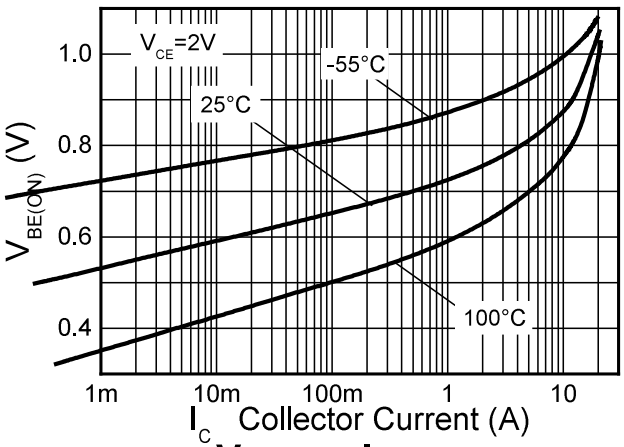
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



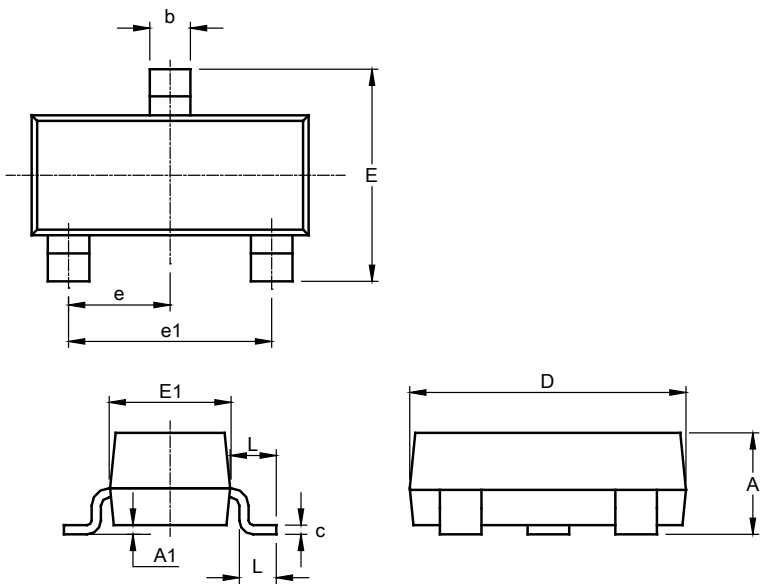
$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package Outline Dimensions

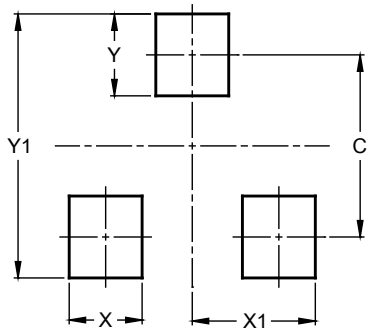
Please see http://www.diodes.com/package-outlines.html for the latest version.



SOT23 (Type DN)			
Dim	**Min**	**Max**	**Typ**
A	0.89	1.12	1.00
A1	0.01	0.10	0.05
b	0.30	0.51	0.45
c	0.08	0.20	0.10
D	2.80	3.04	3.00
E	2.10	2.64	2.42
E1	1.20	1.40	1.37
e	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)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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