



ZXTN19100CFF

100V NPN MEDIUM POWER LOW SATURATION TRANSISTOR IN SOT23F

Features

- BV_{CEO} > 100V
- BV_{CEX} > 200V
- BV_{ECO} > 5V
- I_C = 4.5A Continuous Collector Current
- Low Saturation Voltage V_{CE(SAT)} < 60mV @ 1A
- R_{CE(SAT)} = 38mΩ
- h_{FE} Characterised Up to 5A
- 1.5W Power Dissipation
- Complementary PNP Type: ZXTP19100CFF
- 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

Description

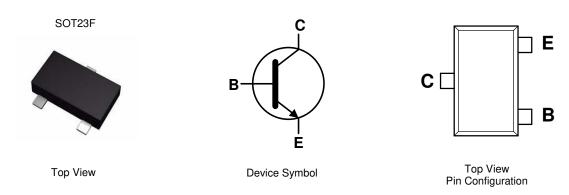
Advanced process capability has been used to maximise the performance of this transistor. The SOT23F package is pin compatible with the industry standard SOT23 footprint but offers lower profile and higher dissipation for applications where power density is of utmost importance.

Mechanical Data

- Case: SOT23F
- 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[®]
- Weight: 0.012 grams (Approximate)

Applications

- Line Switching
- Motor Driving (Including DC Fans)
- High-Side Switches
- Subscriber Line Interface Cards (SLIC)



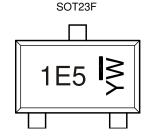
Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN19100CFFTA	AEC-Q101	1E5	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/quality/lead_free.html 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/products/packages.html.

Marking Information



1E5 = Product Type Marking Code YW = Date Code Marking Y = Year : 0~9

 \overline{W} = Week : A~Z : 1~26 a~z : 27~52

z represents 52 & 53 week



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	200	V
Collector-Emitter Voltage (Forward Blocking)	V _{CEX}	200	V
Collector-Emitter Voltage	V _{CEO}	100	V
Emitter-Collector Voltage (Reverse Blocking)	V _{ECO}	5	V
Emitter-Base Voltage	V _{EBO}	7	V
Continuous Collector Current	Ic	4.5	A
Peak Pulse Current	Ісм	6	Α
Base Current	I _B	1	A

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

Characteristic	Symbol	Value	Unit			
	(Note 5)		0.84 6.72			
Power Dissipation Linear Derating Factor	(Note 6)	P _D	1.34 10.72	W		
	(Note 7)		1.50 12.0	mW/°C		
	(Note 8)		2.0 16.0	1		
	(Note 5)		149	°C/W		
Thermal Desistance, Junction to Ambient	(Note 6)		93			
Thermal Resistance, Junction to Ambient	(Note 7)	$R_{ heta JA}$	83			
	(Note 8)		60			
Thermal Resistance, Junction to Lead	(Note 9)	$R_{ heta JL}$	43.8	°C/W		
Operating and Storage Temperature Range	T _{J.} T _{STG}	-55 to +150	°C			

ESD Ratings (Note 10)

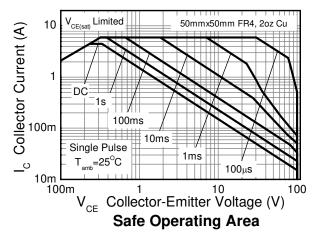
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	С

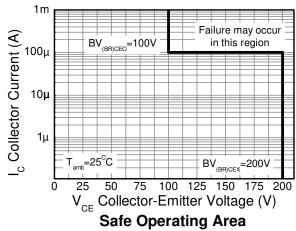
Notes:

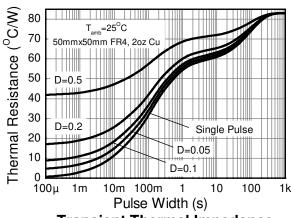
- For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 Same as Note 5, except the device is mounted on 25mm x 25mm 2oz copper.
 Same as Note 5, except the device is mounted on 50mm x 50mm 2oz copper.
 Same as Note 7, whilst measured at t < 5 seconds.
 Thermal resistance from junction to solder-point (at the end of the collector lead).
 Refer to JEDEC specification JESD22-A114 and JESD22-A115.

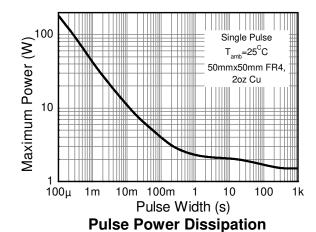


Thermal Characteristics and Derating Information









Transient Thermal Impedance

1.6 Max Power Dissipation (W) 50mmx50mm FR4, 2oz Cu 1.2 1.0 25mmx25mm FR4, 2oz Cu 0.8 0.6 0.4 15mmx15mm FR4, 1oz Cu 0.2 0.0 0 60 80 100 120 Temperature (^OC) 140 160 20 **Derating Curve**



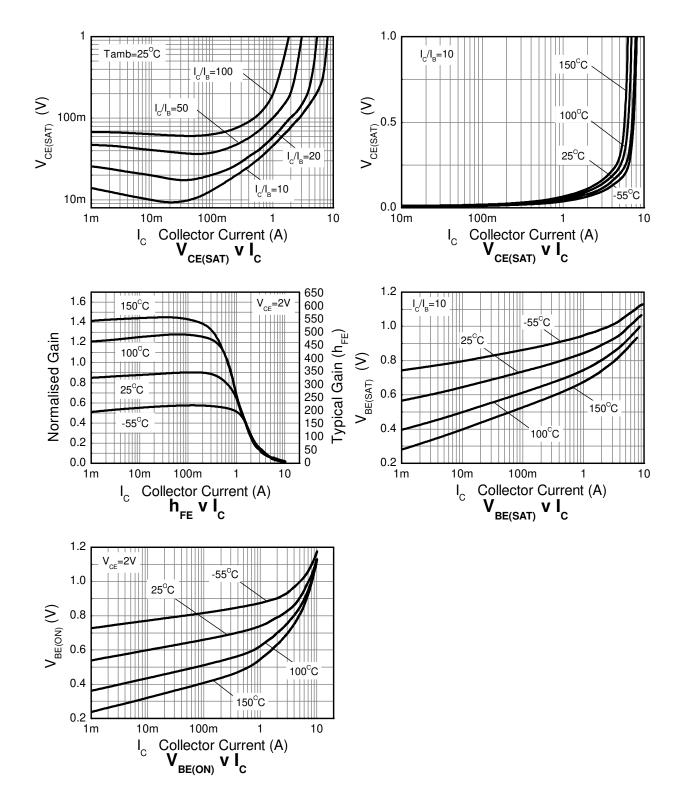
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition	
OFF CHARACTERISTICS							
Collector-Base Breakdown Voltage	BV_CBO	200	240	_	٧	$I_C = 100\mu A$	
Collector-Emitter Breakdown Voltage (Forward Blocking)	BV _{CEX}	200	240	_	V	I_C = 100 μ A, R_{BE} < 1 $k\Omega$ or -1V < V _{BE} < 0.25V	
Collector-Emitter Breakdown Voltage (Base Open) (Note 11)	BV _{CEO}	100	120	_	V	I _C = 10mA	
Emitter-Base Breakdown Voltage	BV_EBO	7	8.3	_	V	$I_E = 100\mu A$	
Emitter-Collector Breakdown Voltage (Reverse Blocking)	BV _{ECX}	6	8.3	_	V	$I_E = 100 \mu A, R_{BC} < 1 k \Omega$ or $0.25 V < V_{BC} < -0.25 V$	
Emitter-Collector Breakdown Voltage (Base Open)	BV _{ECO}	5	8	_	V	I _E = 100μA	
Collector-Base Cutoff Current	I _{CBO}	_	<1 —	50 20	nΑ μΑ	V _{CB} = 160V V _{CB} = 160V, T _A = +100°C	
Emitter-Base Cutoff Current	I _{EBO}	_	<1	50	nA	V _{EB} = 5.6V	
ON CHARACTERISTICS (Note 11)	250						
Static Forward Current Transfer Ratio	h _{FE}	200 130 —	350 250 25	500 — —	-	I _C = 100mA, V _{CE} = 2V I _C = 1A, V _{CE} = 2V I _C = 5A, V _{CE} = 2V	
Collector-Emitter Saturation Voltage	V _{CE} (SAT)	_	45 105 170	60 135 235	mV	$I_C = 1A$, $I_B = 100mA$ $I_C = 1A$, $I_B = 20mA$ $I_C = 4.5A$, $I_B = 450mA$	
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	_	950	1050	mV	$I_C = 4.5A$, $I_B = 450mA$	
Base-Emitter On Voltage	V _{BE(ON)}	_	880	1000	mV	$I_C = 4.5A, V_{CE} = 2V$	
SMALL SIGNAL CHARACTERISTICS	SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	_	150	_	MHz	$I_C = 100$ mA, $V_{CE} = 10$ V, $f = 50$ MHz	
Input Capacitance	C _{IBO}	_	305	_	pF	$V_{EB} = 0.5V$, $f = 1MHz$	
Output Capacitance	C _{OBO}	_	15.7	25	pF	V _{CB} = 10V, f = 1MHz	
Delay Time	t _D	_	28.3	_	ns	101/	
Rise Time	t _R	_	23.6	_	ns	V _{CC} = 10V,	
Storage Time	t _S	_	962	_	ns	$I_C = 500 \text{mA},$ $I_{B1} = I_{B2} = 50 \text{mA}$	
Fall Time	t _F	_	133	_	ns		

Note: 11. Measured under pulsed conditions. Pulse width \leq 300 μ s. Duty cycle \leq 2%



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

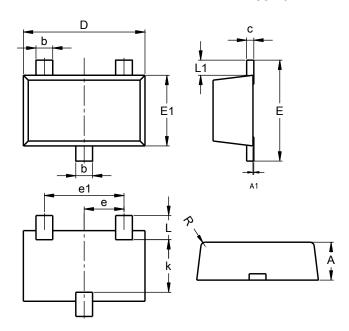




Package Outline Dimensions

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

SOT23F

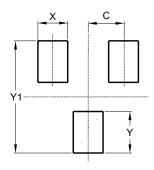


SOT23F					
Dim	Min	Max	Тур		
Α	0.80	1.00	0.90		
b	0.35	0.50	0.44		
С	0.10	0.20	0.16		
D	2.80	3.00	2.90		
е	0.95 REF				
e1	().190 RE	F		
Е	2.30	2.50	2.40		
E1	1.50	1.70	1.65		
k	1.20	-	-		
L	0.30	0.65	0.50		
L1	0.30	0.50	0.40		
R	0.05	0.15	-		
All Dimensions in mm					

Suggested Pad Layout

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

SOT23F



Dimensions	Value (in mm)			
O	0.95			
Х	0.80			
Υ	1.110			
V1	3 000			

For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.



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