

20V PNP LOW SATURATION VOLTAGE TRANSISTOR IN SOT23F

UL Flammability Classification Rating 94V-0

Moisture Sensitivity: Level 1 per J-STD-020

MIL-STD-202, Method 208 (3)

Weight: 0.012 grams (Approximate)

Case Material: Molded Plastic. "Green" Molding Compound.

Terminals: Finish - Matte Tin Plated Leads, Solderable per

Features

- BV_{CEO} > -20V
- BV_{ECO} > -5V
- I_C = -5A Continuous Collector Current
- I_C = -10A Peak Pulse Collector Current
- Low Saturation Voltage V_{CE(SAT)} < -40mV @ -1A
- 1.5W Power Dissipation
- Complementary NPN Type: ZXTN19020CFF
- 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

Applications

Battery Charging

Mechanical Data

Case: SOT23F

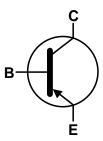
- Load Switch
- DC-DC Converters

Description

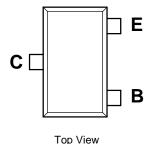
This low voltage PNP transistor has been designed for applications requiring high gain and very low saturation voltage. The SOT23F package is pin compatible with the industry standard SOT23 footprint but offers lower profile and higher dissipation for applications where power density is of utmost importance.







Device Symbol



Pin Configuration

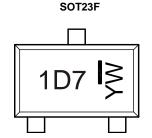
Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ZXTP19020CFFTA	AEC-Q101	1D7	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



1D7 = 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 (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	-25	V
Collector-Emitter Voltage	V _{CEO}	-20	V
Emitter-Collector Voltage (Reverse Blocking)	V _{ECO}	-5	V
Emitter-Base Voltage	V _{EBO}	-7	V
Continuous Collector Current	Ic	-5	Α
Peak Pulse Current	Ісм	-10	Α
Base Current	Ι _Β	-1	Α

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

Characteristic	Symbol	Value	Unit		
	(Note 5)		0.84 6.72	1	
Power Dissipation	(Note 6)	P _D	1.34 10.72	W mW/°C	
Linear Derating Factor	(Note 7)		1.50 12.0		
	(Note 8)		2.0 16.0		
	(Note 5)	$R_{ heta JA}$	149	°C/W	
Thormal Desistance, Junction to Ambient	(Note 6)		93.4		
Thermal Resistance, Junction to Ambient	(Note 7)		83.3		
	(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)

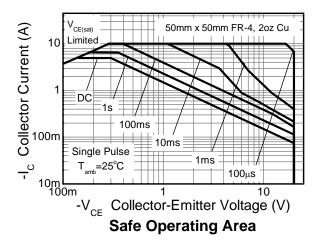
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge – Machine Model	ESD MM	400	V	С

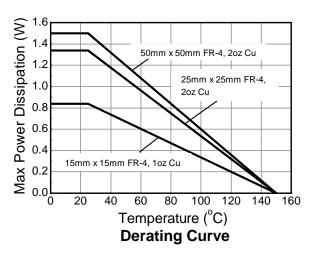
5. For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Same as Note 5, except the device is mounted on 25mm x 25mm 2oz copper. Notes:

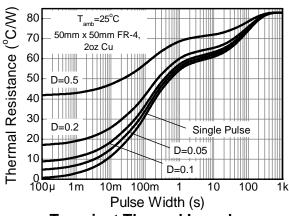
- 7. Same as Note 5, except the device is mounted on 50mm x 50mm 2oz copper.
- 8. Same as Note 7, whilst measured at t < 5 seconds.
- 9. Thermal resistance from junction to solder-point (at the end of the collector lead).
- 10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

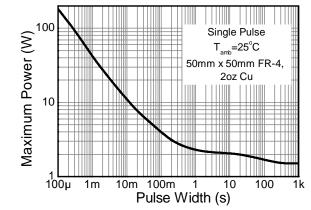


Thermal Characteristics and Derating Information









Transient Thermal Impedance

Pulse Power Dissipation



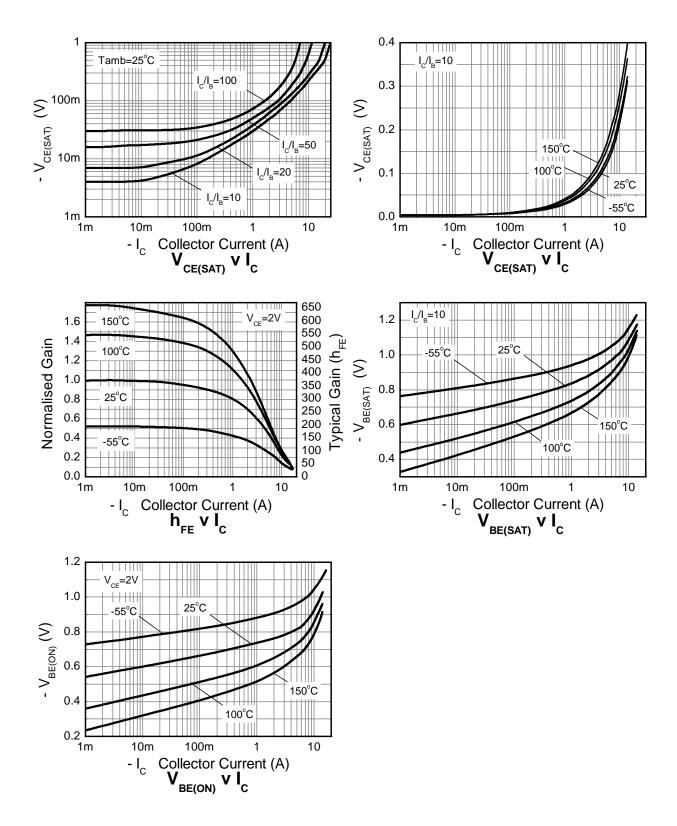
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV _{CBO}	-25	-45	_	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Base Open) (Note 11)	BV _{CEO}	-20	-30	_	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8.3	_	V	I _E = -100μA
Emitter-Collector Breakdown Voltage (Reverse Blocking)	BV _{ECX}	-6	-8.3	_	V	I_E = -100μA, R_{BC} ≤ 1k Ω or 0.25V < V_{BC} < -0.25V
Emitter-Collector Breakdown Voltage (Base Open)	BV _{ECO}	-5	-8.5	_	V	I _E = -100μA
Collector-Base Cutoff Current	I _{CBO}	_	<-1 —	-50 -20	nΑ μΑ	V _{CB} = -20V V _{CB} = -20V, T _A = +100°C
Emitter-Base Cutoff Current	I _{EBO}	_	<-1	-50	nA	V _{EB} = -5.6V
ON CHARACTERISTICS (Note 11)						
Static Forward Current Transfer Ratio	h _{FE}	200 170 110	350 300 180	500 — —	_	$I_C = -100$ mA, $V_{CE} = -2V$ $I_C = -1$ A, $V_{CE} = -2V$ $I_C = -5$ A, $V_{CE} = -2V$
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	_	-30 -50 -75 -105	-40 -70 -120 -135	mV	I_C = -1A, I_B = -100mA I_C = -1A, I_B = -20mA I_C = -2A, I_B = -40mA I_C = -5A, I_B = -500mA
Base-Emitter Saturation Voltage	V _{BE(SAT)}	_	-925	-1050	mV	$I_C = -5A$, $I_B = -500mA$
Base-Emitter On Voltage	V _{BE(ON)}	_	-815	-950	mV	I _C = -5A, V _{CE} = -2V
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f⊤	_	200	_	MHz	$I_C = -50$ mA, $V_{CE} = -10$ V, $f = 50$ MHz
Output Capacitance	Сово	_	52	70	pF	V _{CB} = -10V, f = 1MHz
Delay Time	t _D		66.8	_	ns	\/ 45\/
Rise Time	t _R	_	74.5	_	ns	$V_{CC} = -15V$, $I_{C} = -750$ mA,
Storage Time	ts	_	226	_	ns	$-I_{B1} = -I_{B2} = -15\text{mA}$
Fall Time	t _F	_	85.5	_	ns	181 - 187 - 101117

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.)

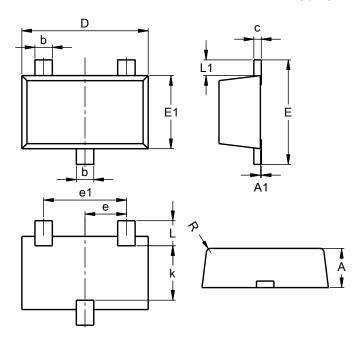




Package Outline Dimensions

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

SOT23F

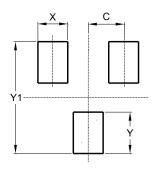


SOT23F						
Dim	Min	Max	Тур			
Α	0.80	1.00	0.90			
A1	0.00	0.10	0.01			
b	0.35	0.50	0.44			
С	0.10	0.20	0.16			
D	2.80	3.00	2.90			
е	0.95 REF					
e1	1.90 REF					
Е	2.30	2.50	2.40			
E1	1.50	1.70	1.65			
k	1.20	-	-			
L	0.30	0.65	0.50			
L1	0.30	0.50	0.40			
R	0.05	0.15	-			
All Dimensions in mm						

Suggested Pad Layout

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

SOT23F



Dimensions	Value (in mm)		
С	0.95		
Х	0.80		
Υ	1.110		
Y1	3.000		



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