



20V PNP MEDIUM POWER TRANSISTOR IN SOT23F

Description

Advanced process capability and packaging maximize the power handling and performance of this small outline transistor. The reverse blocking capability of the transistor can often result in the elimination of a series connected Schottky diode commonly required with either bipolar transistors or MOSFETs when used in battery charging applications.

Features

- BV_{CEO} > -20V
- BV_{ECO} > -7V
- I_C = -4.5A Continuous Collector Current
- Low Saturation Voltage V_{CE(SAT)} < -65mV @ -1A
- $R_{CE(SAT)} = 41m\Omega$
- h_{FE} Characterised Up to -10A
- 1.5W Power Dissipation
- 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

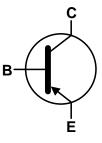
- Case: SOT23F
- Case Material: Molded Plastic. "Green" Molding Compound.
 UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (§3)
- Weight: 0.012 grams (Approximate)

Applications

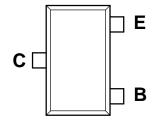
- Mobile Phone Charging Circuits
- MOSFET and IGBT Gate Drivers
- High-Side Driving
- Motor Control
- Disconnect Switch in Portable Products
- DC-DC Convertors







Device Symbol



Top View Pin Configuration

Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ZXTP25020CFFTA	AEC-Q101	1F4	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

1F4 | | |

SOT23F

1F4 = Product Type Marking Code YW = Date Code Marking

 \underline{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}	-25	V
Collector-Emitter Voltage	V _{CEO}	-20	V
Emitter-Collector Voltage (Reverse Blocking)	V _{ECO}	-7	V
Emitter-Base Voltage	V _{EBO}	-7	V
Continuous Collector Current	Ic	-4.5	А
Peak Pulse Current	Ісм	-10	Α
Base Current	I _B	-1	А

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

Characteristic	Symbol	Value	Unit		
	(Note 5)		0.79 6.3		
Power Dissipation	(Note 6)	P _D	1.13 9.0	W mW/°C	
inear Derating Factor	(Note 7)		1.50 12.0		
	(Note 8)		1.96 15.7		
	(Note 5)	R _{eJA}	158.7		
Thermal Decistores, Junction to Ambient	(Note 6)		110.4	°C/W	
Thermal Resistance, Junction to Ambient	(Note 7)		83.3	1 C/VV	
	(Note 8)		63.7		
Thermal Resistance, Junction to Lead (Note 9)		R _{0JL}	60	°C/W	
Operating and Storage Temperature Range	$T_{J_i} T_{STG}$	-55 to +150	°C		

ESD Ratings (Note 10)

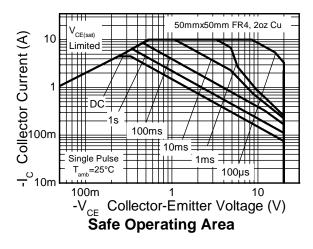
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge – Machine Model	ESD MM	400	V	С

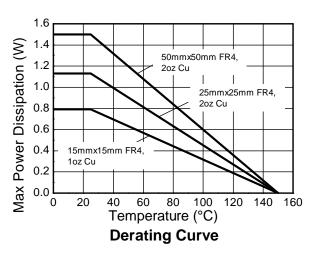
Notes:

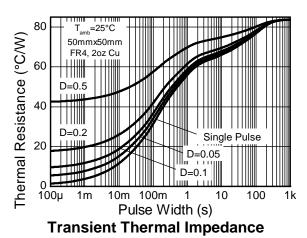
- 5. For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
- Same as Note 5, except the device is mounted on 25mm x 25mm 2oz copper.
- 7. Same as Note 5,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

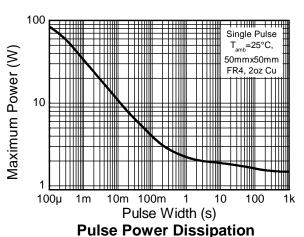


Thermal Characteristics and Derating Information











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

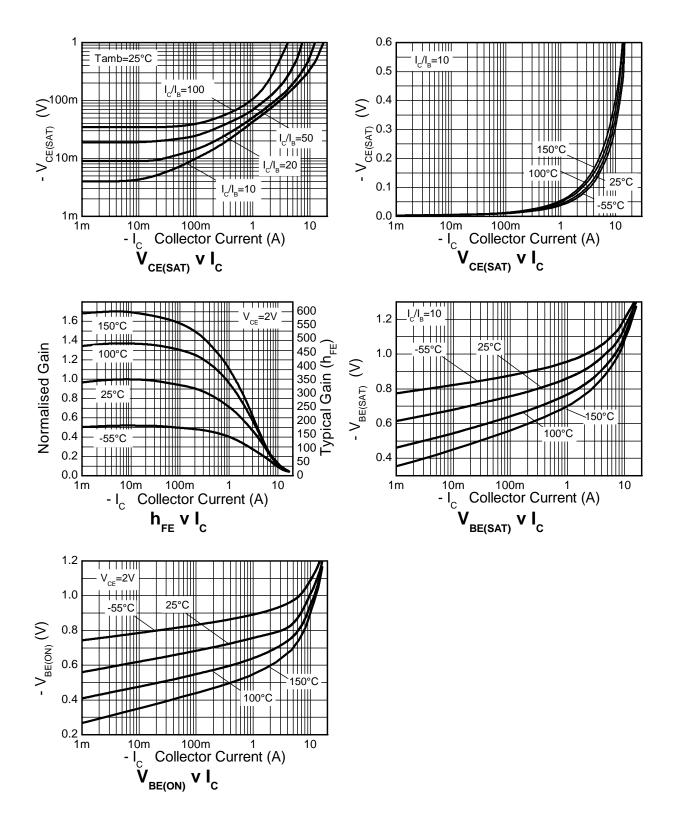
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV _{CBO}	-25	-50	_	V	$I_{C} = -100 \mu A$
Collector-Emitter Breakdown Voltage (Base Open) (Note 11)	BV _{CEO}	-20	-35		٧	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8.2	_	V	$I_E = -100 \mu A$
Emitter-Collector Breakdown Voltage (Reverse Blocking) (Note 11)	BV _{ECX}	-7	-8.0	_	V	I_E = -100μA R_{BC} <10k Ω or -0.25V< V_{BC} <0.25V
Emitter-Collector Breakdown Voltage (Base Open) (Note 11)	BV _{ECO}	-7	-8.8	_	V	I _E = -100μA
Collector-Base Cutoff Current	I _{CBO}		<-1	-50	nA	V _{CB} = -20V
	iCBO		_	-20	μΑ	$V_{CB} = -20V, T_A = +100^{\circ}C$
Emitter-Base Cutoff Current	I _{EBO}	_	<-1	-50	nA	$V_{EB} = -5.6V$
ON CHARACTERISTICS (Note 11)						
Static Forward Current Transfer Ratio	h _{FE}	200 150 85 —	350 250 140 40	500 — — —	_	$I_C = -10 \text{mA}, V_{CE} = -2 \text{V}$ $I_C = -1 \text{A}, V_{CE} = -2 \text{V}$ $I_C = -4 \text{A}, V_{CE} = -2 \text{V}$ $I_C = -10 \text{A}, V_{CE} = -2 \text{V}$
Collector-Emitter Saturation Voltage	V _{CE(SAT)}	_	-50 -80 -135 -210	-65 -110 -185 -260	mV	$I_C = -1A$, $I_B = -100mA$ $I_C = -1A$, $I_B = -20mA$ $I_C = -2A$, $I_B = -40mA$ $I_C = -4.5A$, $I_B = -225mA$
Base-Emitter Saturation Voltage	V _{BE(SAT)}	_	-950	-1,050	mV	$I_C = -4.5A$, $I_B = -225mA$
Base-Emitter On Voltage	V _{BE(ON)}	_	-840	-950	mV	I _C = -4.5A, V _{CE} = -2V
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f _T	_	285	_	MHz	$I_C = -50 \text{mA}, V_{CE} = -10 \text{V},$ f = 100 MHz
Output Capacitance	C _{OBO}	_	32.4	40	pF	$V_{CB} = -10V$, $f = 1MHz$
Delay Time	t _D	_	38.4	_	ns	15)/
Rise Time	t _R	_	49.2	_	ns	V _{CC} = -15V,
Storage Time	t _S	_	168	_	ns	$I_C = -750 \text{mA},$ $I_{B1} = I_{B2} = -15 \text{mA}$
Fall Time	t _F	_	55	_	ns	181 – 185 – - 19111V

Note:

11. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.



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

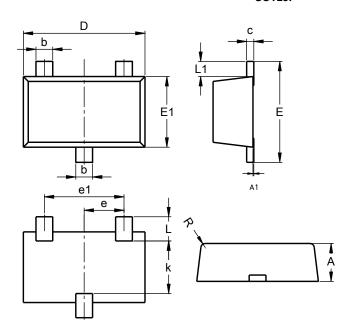




Package Outline Dimensions

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

SOT23F

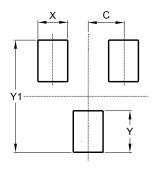


SOT23F						
Dim	Min Max		Тур			
Α	0.80	1.00	0.90			
b	0.35	0.50	0.44			
С	0.10	0.20	0.16			
D	2.80	3.00	2.90			
е	0.95 REF					
e1	0.190 REF					
Е	2.30 2.50 2.4					
E1	1.50	1.70	1.65			
k	1.20					
L	0.30 0.65 0.50					
L1	0.30 0.50 0.40					
R	R 0.05 0.15 -					
All Dimensions in mm						

Suggested Pad Layout

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

SOT23F



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



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