

Features

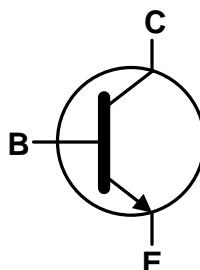
- $BV_{CEO} > 20V$
- $I_C = 6.5A$ Continuous Collector Current
- Very Low Saturation Voltage $V_{CE(sat)} < 30mV$ @ 1A
- $R_{CE(sat)} = 18m\Omega$
- High h_{FE} Min 260 @ 2A
- 1.5W Power Dissipation
- High Forward Blocking Voltage
- Complementary PNP Type: ZXTP19020DFF
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 and 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Description

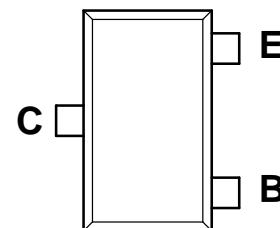
Advanced process capability has been used to maximize the performance of this transistor. The SOT23F package is compatible with the industry standard SOT23 footprint but offers lower profile and higher dissipation for applications where power density is of utmost importance.



Top View



Device Symbol



Top View
Pin Configuration

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 (e3)
- Weight: 0.012 grams (Approximate)

Applications

- MOSFET and IGBT Gate Drivers
- LED Driver
- Strobe Flash
- Motor Drive
- Micro Buffers

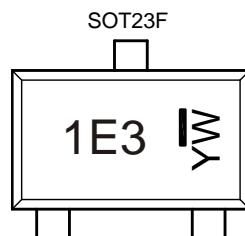
Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN19020DFFTA	AEC-Q101	1E3	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



1E3 = Product Type Marking Code

YW = Date Code Marking

Y = Year : 0~9

W = Week : A-Z : 1~26

a~z : 27~52

z represents 52 & 53 week

Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	70	V
Collector-Emitter Voltage (Forward Blocking)	V_{CEX}	70	V
Collector-Emitter Voltage	V_{CEO}	20	V
Emitter-Collector Voltage (Reverse Blocking)	V_{ECO}	4.5	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	6.5	A
Peak Pulse Current	I_{CM}	20	A
Base Current	I_B	1	A

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P_D	0.84	W mW/°C
		6.72	
		1.34	
		10.72	
		1.50	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	12.0	°C/W
		2.0	
		16.0	
		149	
Thermal Resistance, Junction to Lead	$R_{\theta JL}$	93	°C/W
		83	
		60	
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

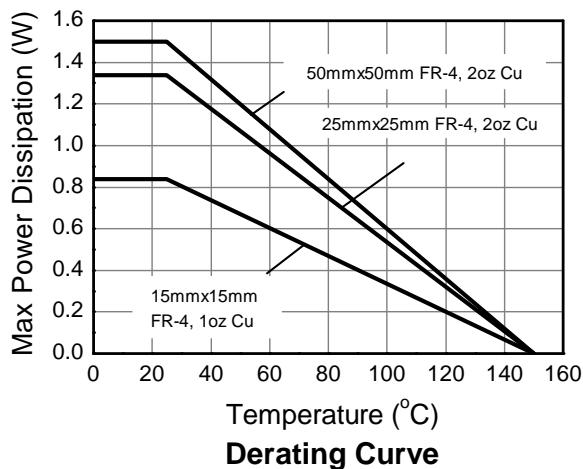
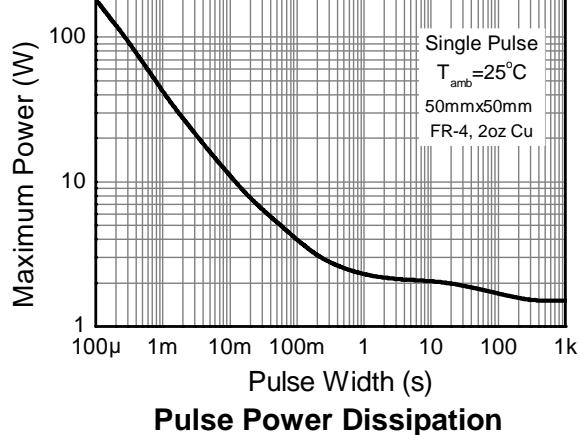
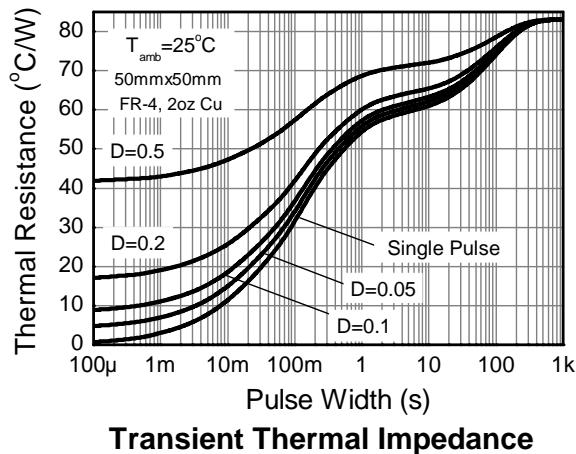
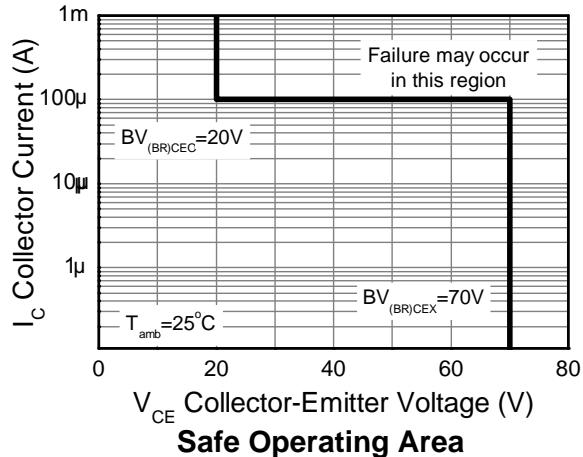
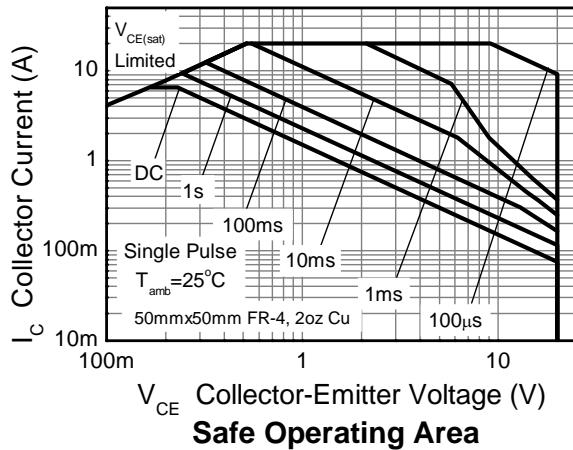
ESD Ratings (Note 10)

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	C

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 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.
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

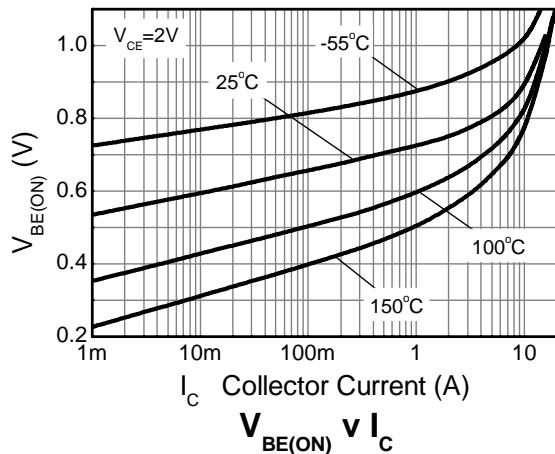
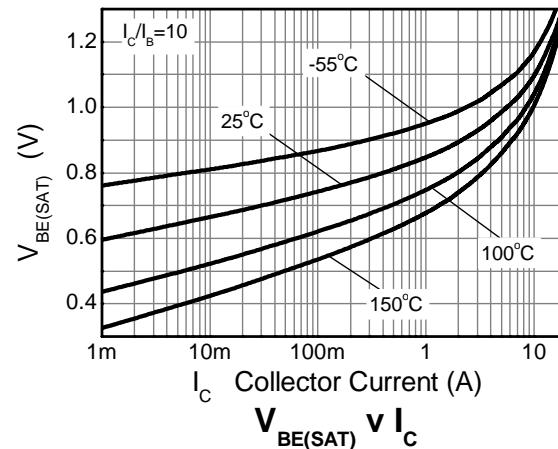
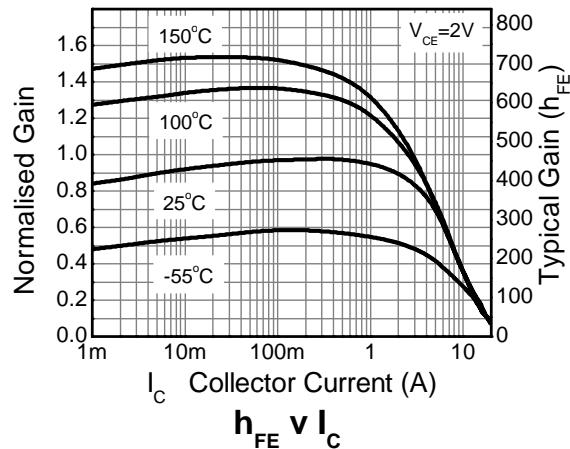
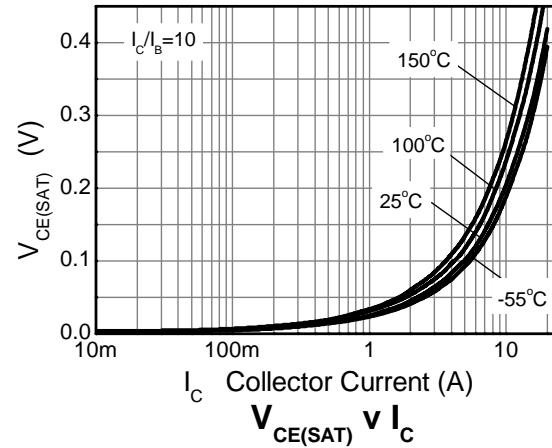
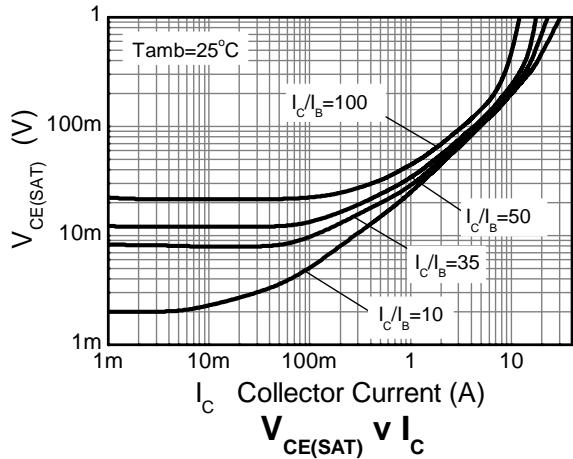


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	70	100	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Forward Blocking)	BV_{CEX}	70	100	—	V	$I_C = 100\mu\text{A}; R_{BC} < 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Collector-Emitter Breakdown Voltage (Base Open) (Note 11)	BV_{CEO}	20	30	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.4	—	V	$I_E = 100\mu\text{A}$
Emitter-Collector Breakdown Voltage (Reverse Blocking)	BV_{ECX}	6	8.4	—	V	$I_E = 100\mu\text{A}; R_{BC} \leq 1\text{k}\Omega$ or $-0.25\text{V} < V_{BC} < 0.25\text{V}$
Emitter-Collector Breakdown Voltage (Base Open)	BV_{ECO}	4.5	5.7	—	V	$I_E = 100\mu\text{A}$
Collector-Base Cut-Off Current	I_{CBO}	—	<1	50	nA	$V_{CB} = 56\text{V}$
			—	20	μA	$V_{CB} = 56\text{V}, T_A = +100^\circ\text{C}$
Collector-Emitter Cut-Off Current	I_{CEX}	—	—	100	nA	$V_{CE} = 56\text{V}; R_{BE} \leq 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Emitter-Base Cut-Off Current	I_{EBO}	—	<1	50	nA	$V_{EB} = 5.6\text{V}$
ON CHARACTERISTICS (Note 11)						
Static Forward Current Transfer Ratio	h_{FE}	300 260 160 50	450 420 270 80	900 — — —	—	$I_C = 0.1\text{A}, V_{CE} = 2\text{V}$ $I_C = 2\text{A}, V_{CE} = 2\text{V}$ $I_C = 6.5\text{A}, V_{CE} = 2\text{V}$ $I_C = 15\text{A}, V_{CE} = 2\text{V}$
Collector-Emitter Saturation Voltage	$V_{\text{CE}(\text{sat})}$	—	25 45 70 55 140	30 65 95 75 190	mV	$I_C = 1\text{A}, I_B = 100\text{mA}$ $I_C = 1\text{A}, I_B = 10\text{mA}$ $I_C = 2\text{A}, I_B = 20\text{mA}$ $I_C = 2\text{A}, I_B = 40\text{mA}$ $I_C = 6.5\text{A}, I_B = 180\text{mA}$
Base-Emitter Saturation Voltage	$V_{\text{BE}(\text{sat})}$	—	940	1050	mV	$I_C = 6.5\text{A}, I_B = 180\text{mA}$
Base-Emitter On Voltage	$V_{\text{BE}(\text{on})}$	—	830	950	mV	$I_C = 6.5\text{A}, V_{CE} = 2\text{V}$
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	—	160	—	MHz	$I_C = 50\text{mA}, V_{CE} = 5\text{V}, f = 50\text{MHz}$
Input Capacitance	C_{ibo}	—	297	—	pF	$V_{EB} = 0.5\text{V}, f = 1\text{MHz}$
Output Capacitance	C_{obo}	—	32.6	40	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Delay Time	t_d	—	129	—	ns	
Rise Time	t_r	—	96	—	ns	
Storage Time	t_s	—	398	—	ns	
Fall Time	t_f	—	90	—	ns	

Note: 11. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

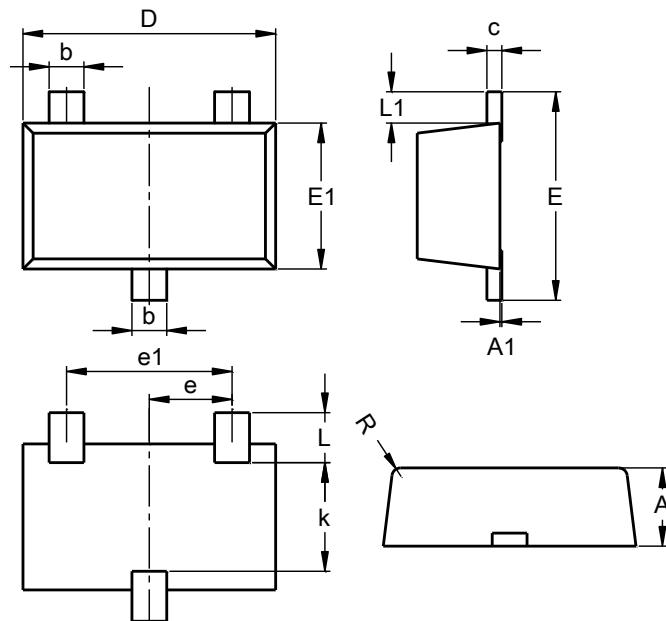
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Package Outline Dimensions

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

SOT23F



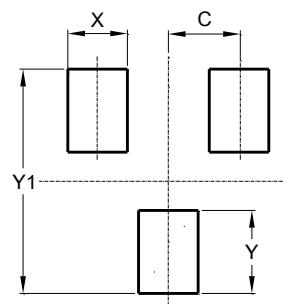
SOT23F			
Dim	Min	Max	Typ
A	0.80	1.00	0.90
A1	0.00	0.10	0.01
b	0.35	0.50	0.44
c	0.10	0.20	0.16
D	2.80	3.00	2.90
e	0.95 REF		
e1	1.90 REF		
E	2.30	2.50	2.40
E1	1.50	1.70	1.65
k	1.20	-	-
L	0.30	0.65	0.50
L1	0.30	0.50	0.40
R	0.05	0.15	-

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)
C	0.95
X	0.80
Y	1.110
Y1	3.000

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