

ZXTN04120HFF120V, SOT23F, NPN medium power Darlington transistor

Summary

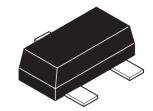
 $BV_{CEO} > 120V$

 $I_{C(cont)} = 1A$

 $V_{CE(sat)} < 1.5V @ 1A$

 $P_{D} = 1.5W$

Complementary part number ZXTP05120HFF

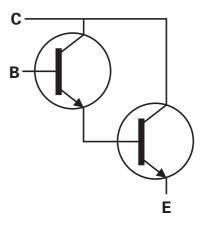


Description

This high performance NPN Darlington transistor is housed in the small outline SOT23 flat package for applications where space is at a premium.

Features

- · Darlington transistor
- 120 volt
- · 1 amp continuous rating
- · Small outline surface mount SOT23 flat package

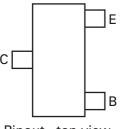


Applications

- · Lamp, relay and solenoid drive
- Lighting

Ordering information

Device	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN04120HFFTA	7	8	3000



Pinout - top view

Device marking

1F6

Absolute maximum ratings

Parameter	Symbol	Limit	Unit
Collector-base voltage	V _{CBO}	140	V
Collector-emitter voltage	V _{CEO}	120	V
Emitter-base voltage	V _{EBO}	10	V
Continuous collector current (c)	Ic	1	Α
Peak pulse current	I _{CM}	4	Α
Base current	I _B	0.5	Α
Power dissipation @ T _{amb} =25°C ^(a)	P _D	0.84	W
Linear derating factor		6.72	mW/°C
Power dissipation @ T _{amb} =25°C ^(b)	P _D	1.34	W
Linear derating factor		10.72	mW/°C
Power dissipation @ T _{amb} =25°C ^(c)	P _D	1.5	W
Linear derating factor		12.0	mW/°C
Power dissipation @ T _{amb} =25°C ^(d)	P _D	2.0	W
Linear derating factor		16.0	mW/°C
Operating and storage temperature range	T _j , T _{stg}	- 55 to 150	°C

Thermal resistance

Parameter	Symbol	Limit	Unit	
Junction to ambient ^(a)	$R_{\Theta JA}$	149	°C/W	
Junction to ambient ^(b)	$R_{\Theta JA}$	93	°C/W	
Junction to ambient ^(c)	$R_{\Theta JA}$	83	°C/W	
Junction to ambient ^(d)	$R_{\Theta JA}$	60	°C/W	

NOTES:

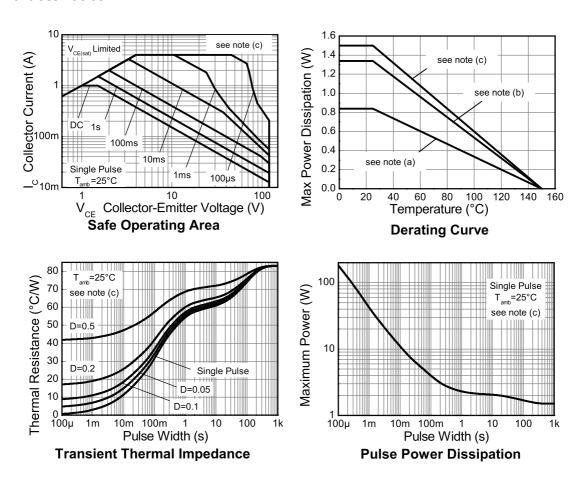
⁽a) For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.

⁽b) Mounted on 25mm x 25mm x 1.6mm FR4 PCB with a high coverage of single sided 2oz copper in still air conditions.

⁽c) Mounted on 50mm x 50mm x 1.6mm FR4 PCB with a high coverage of single sided 2oz copper in still air conditions.

⁽d) As (c) above measured at t<5secs.

Characteristics



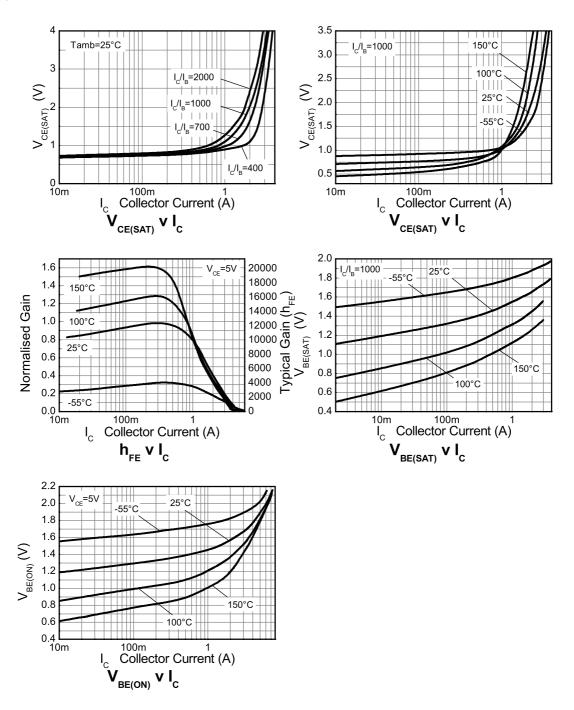
Electrical characteristics (at T_{amb} = 25°C unless otherwise stated)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions
Collector-base breakdown voltage	BV _{CBO}	140	300		V	I _C = 100μA
Collector-emitter breakdown voltage (base open)	BV _{CEO}	120	140		V	I _C = 10mA ^(*)
Emitter-base breakdown voltage	BV _{EBO}	10	16		V	$I_E = 100 \mu A$
Collector-base cut-off current	Ісво		<1	100	nA	V _{CB} = 120V
				10	μΑ	$V_{CB} = 120V, T_{amb} = 100^{\circ}C$
Collector-emitter cut-off current	I _{CES}		<0.1	10	μΑ	V _{CE} = 120V
Emitter-base cut-off current	I _{EBO}		<1	100	nA	V _{EB} = 8V
Collector-emitter saturation	V _{CE(sat)}		0.8	0.9	V	$I_C = 250 \text{mA}, I_B = 0.25 \text{mA}^{(*)}$
voltage			1.1	1.5	V	$I_C = 1A, I_B = 1mA^{(*)}$
			1.1	1.5	V	$I_C = 2A$, $I_B = 5mA^{(*)}$
Base-emitter saturation voltage	V _{BE(sat)}		1.55	1.70	V	I _C = 1A, I _B = 1mA ^(*)
Base-emitter turn-on voltage	V _{BE(on)}		1.45	1.70	V	$I_C = 1A$, $V_{CE} = 5V^{(*)}$
Static forward current	h _{FE}	3K	11k			I _C = 50mA, V _{CE} = 5V ^(*)
transfer ratio		3K	12k			$I_C = 500 \text{mA}, V_{CE} = 5V^{(*)}$
		3K	10k	30K		$I_C = 1A, V_{CE} = 5V^{(*)}$
		1K	5k			$I_C = 2A$, $V_{CE} = 5V^{(*)}$
Transition frequency	f _T		120		MHz	I _C = 100mA, V _{CE} = 10V f = 20MHz
Input capacitance	C _{ibo}		68	90	pF	V _{EB} = 500mV, f = 1MHz ^(*)
Output capacitance	C _{obo}		12.8	25	pF	V _{CB} = 10V, f = 1MHz ^(*)
Delay time	t _d		507		ns	V _{CC} = 10V
Rise time	t _r		136		ns	$I_{C} = 500 \text{mA},$ $I_{B1} = I_{B2} = 0.5 \text{mA}$
Storage time	t _s		910		ns	IB1 - IB2- 0.5IIIA
Fall time	t _f		369		ns	

NOTES:

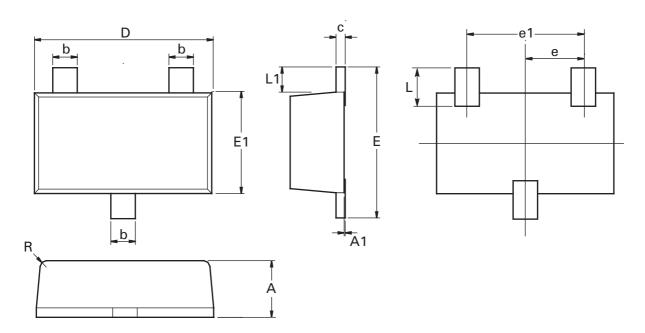
^(*) Measured under pulsed conditions. Pulse width ${\leq}300\mu s;$ duty cycle ${\leq}2\%.$

Typical characteristics



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Package outline - SOT23F



Dim.	Millimeters		Inches		Dim.	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
Α	0.80	1.00	0.0315	0.0394	E	2.30	2.50	0.0906	0.0984
A1	0.00	0.10	0.00	0.0043	E1	1.50	1.70	0.0590	0.0669
b	0.35	0.45	0.0153	0.0161	L	0.48	0.68	0.0189	0.0268
С	0.10	0.20	0.0043	0.0079	L1	0.30	0.50	0.0153	0.0161
D	2.80	3.00	0.1102	0.1181	R	0.05	0.15	0.0019	0.0059
е	0.95	ref	0.037	74 ref	0	0°	12°	0°	12°
e1	1.80	2.00	0.0709	0.0787	-	-	-	-	-

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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