

INCHANGE Semiconductor

isc Product Specification

isc Silicon NPN Power Transistors

BDT31F/AF/BF/CF/DF

DESCRIPTION

- DC Current Gain $-h_{FE} = 25(\text{Min}) @ I_C = 1.0\text{A}$
- Collector-Emitter Sustaining Voltage-
: $V_{CEO(\text{SUS})} = 40\text{V}(\text{Min})$ - BDT31F; $60\text{V}(\text{Min})$ - BDT31AF
 $80\text{V}(\text{Min})$ - BDT31BF; $100\text{V}(\text{Min})$ - BDT31CF
 $120\text{V}(\text{Min})$ - BDT31DF
- Complement to Type BDT32F/AF/BF/CF/DF

APPLICATIONS

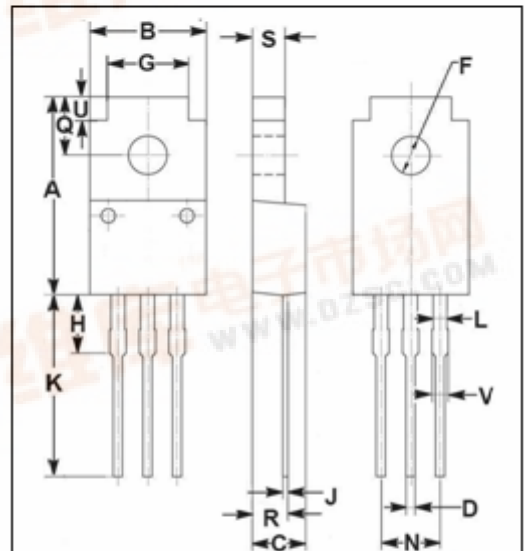
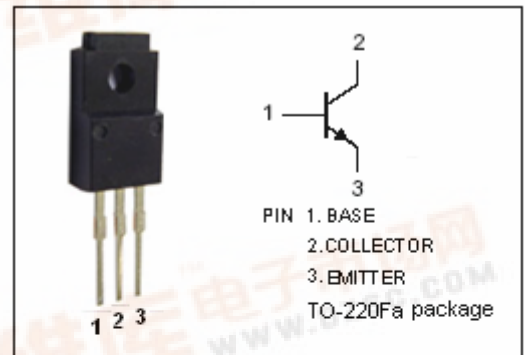
- Designed for use in audio amplifier output stages , general purpose amplifier and high speed switching applications

ABSOLUTE MAXIMUM RATINGS($T_a=25^\circ\text{C}$)

SYMBOL	PARAMETER		VALUE	UNIT
V_{CBO}	Collector-Base Voltage	BDT31F	80	V
		BDT31AF	100	
		BDT31BF	120	
		BDT31CF	140	
		BDT31DF	160	
V_{CEO}	Collector-Emitter Voltage	BDT31F	40	V
		BDT31AF	60	
		BDT31BF	80	
		BDT31CF	100	
		BDT31DF	120	
V_{EBO}	Emitter-Base Voltage		5	V
I_C	Collector Current-Continuous		3	A
I_{CM}	Collector Current-Peak		5	A
I_B	Base Current		1	A
P_C	Collector Power Dissipation $T_C=25^\circ\text{C}$		22	W
T_j	Junction Temperature		150	$^\circ\text{C}$
T_{stg}	Storage Temperature Range		-65~150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	MAX	UNIT
$R_{th(j-c)}$	Thermal Resistance, Junction to Case	8.12	$^\circ\text{C/W}$
$R_{th(j-a)}$	Thermal Resistance, Junction to Ambient	55	$^\circ\text{C/W}$



DIM	mm	
	MIN	MAX
A	16.85	17.15
B	9.90	10.10
C	4.35	4.65
D	0.75	0.80
F	3.20	3.40
G	6.90	7.10
H	5.15	5.45
J	0.45	0.75
K	13.35	13.65
L	1.10	1.30
N	4.98	5.18
Q	4.85	5.15
R	2.95	3.25
S	2.70	2.90
U	1.75	2.05
V	1.30	1.50

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ELECTRICAL CHARACTERISTICS

 $T_C=25^{\circ}\text{C}$ unless otherwise specified

SYMBOL	PARAMETER		CONDITIONS	MIN	TYP.	MAX	UNIT
$V_{CEO(SUS)}$	Collector-Emitter Sustaining Voltage	BDT31F	$I_C=30\text{mA}; I_B=0$	40			V
		BDT31AF		60			
		BDT31BF		80			
		BDT31CF		100			
		BDT31DF		120			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	BDT31F/AF/BF/CF	$I_C=3\text{A}; I_B=0.375\text{A}$			1.2	V
		BDT31DF	$I_C=3\text{A}; I_B=0.75\text{A}$			2.5	
$V_{BE(on)}$	Base-Emitter On Voltage		$I_C=3\text{A}; V_{CE}=4\text{V}$			1.8	V
I_{CES}	Collector Cutoff Current		$V_{CE}=V_{CE0max}; V_{BE}=0$			0.2	mA
I_{CEO}	Collector Cutoff Current	BDT31F/AF	$V_{CE}=30\text{V}; I_B=0$			0.1	mA
		BDT31BF/CF	$V_{CE}=60\text{V}; I_B=0$				
		BDT31DF	$V_{CE}=90\text{V}; I_B=0$				
I_{EBO}	Emitter Cutoff Current		$V_{EB}=5\text{V}; I_C=0$			0.2	mA
h_{FE-1}	DC Current Gain		$I_C=1\text{A}; V_{CE}=4\text{V}$	25			
h_{FE-2}	DC Current Gain	BDT31F/AF/BF/CF	$I_C=3\text{A}; V_{CE}=4\text{V}$	10		50	
		BDT31DF		5			
f_T	Current-Gain—Bandwidth Product		$I_C=0.5\text{A}; V_{CE}=10\text{V}$	3			MHz

Switching Times

t_{on}	Turn-On Time	$I_C=1.0\text{A}; I_{B1}=-I_{B2}=0.1\text{A}$		0.3		μs
t_{off}	Turn-Off Time			1.0		μs