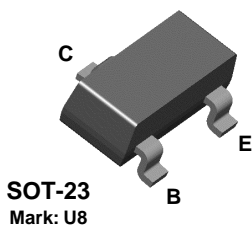


BSR14



NPN General Purpose Amplifier

This device is for use as a medium power amplifier and switch requiring collector currents up to 500 mA. Sourced from Process 19. See BCW65C for characteristics.

Absolute Maximum Ratings* TA = 25°C unless otherwise noted

Symbol	Parameter	Value	Units
V_{CEO}	Collector-Emitter Voltage	40	V
V_{CBO}	Collector-Base Voltage	75	V
V_{EBO}	Emitter-Base Voltage	6.0	V
I_C	Collector Current - Continuous	800	mA
T_J, T_{stg}	Operating and Storage Junction Temperature Range	-55 to +150	°C

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics TA = 25°C unless otherwise noted

Symbol	Characteristic	Max	Units
		*BSR14	
P_D	Total Device Dissipation Derate above 25°C	350	mW
		2.8	mW/°C
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	357	°C/W

*Device mounted on FR-4 PCB 40 mm X 40 mm X 1.5 mm.

NPN General Purpose Amplifier

(continued)

BSR14

Electrical Characteristics

TA = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Max	Units
OFF CHARACTERISTICS					
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage	I _C = 10 μA, I _B = 0	75		V
V _{(BR)CBO}	Collector-Base Breakdown Voltage	I _C = 10 μA, I _E = 0	40		V
V _{(BR)EBO}	Emitter-Base Breakdown Voltage	I _E = 10 μA, I _C = 0	6.0		V
I _{CBO}	Collector-Cutoff Current	V _{CB} = 60 V V _{CB} = 60 V, T _A = 150°C		10 10	nA μA
I _{CEX}	Collector-Cutoff Current	V _{CE} = 60 V, V _{EB} = 3.0 V		10	nA
I _{BEX}	Reverse Base Current	V _{CE} = 60 V, V _{EB} = 3.0 V		20	nA
I _{EBO}	Emitter-Cutoff Current	V _{EB} = 3.0 V, I _C = 0		15	nA

ON CHARACTERISTICS

h _{FE}	DC Current Gain	I _C = 0.1 mA, V _{CE} = 10 V I _C = 1.0 mA, V _{CE} = 10 V I _C = 10 mA, V _{CE} = 10 V I _C = 150 mA, V _{CE} = 10 V I _C = 150 mA, V _{CE} = 1.0 V I _C = 500 mA, V _{CE} = 10 V	35 50 75 100 50 40	300	
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _C = 150 mA, I _B = 15 mA I _C = 500 mA, I _B = 50 mA		0.3 1.0	V V
V _{BE(sat)}	Base-Emitter Saturation Voltage	I _C = 150 mA, I _B = 15 mA I _C = 500 mA, I _B = 50 mA	0.6	1.2 2.0	V V

SMALL SIGNAL CHARACTERISTICS

f _T	Current Gain - Bandwidth Product	I _C = 20 mA, V _{CE} = 20, f = 100 mHz	300		MHz
C _{CB}	Collector-Base Capacitance	V _{CB} = 10V, I _E = 0, f = 1.0 MHz		8.0	pF
h _{ie}	Input Impedance	V _{CE} = 10V, I _C = 1.0 mA, f = 1.0 kHz	2.0	8.0	kΩ
h _{fe}	Small-Signal Current Gain	V _{CE} = 10V, I _C = 1.0 mA, f = 1.0 kHz	50	300	
h _{oe}	Output Admittance	V _{CE} = 10V, I _C = 1.0 mA, f = 1.0 kHz	5	35	μS

SWITCHING CHARACTERISTICS

t _d	Delay Time	V _{CC} = 30 V, V _{BE(OFF)} = 0.5 V,		10	ns
t _r	Rise Time	I _C = 150 mA, I _{B1} = 15 mA		25	ns
t _s	Storage Time	V _{CC} = 30 V, I _C = 150 mA,		225	ns
t _f	Fall Time	I _{B1} = I _{B2} = 15 mA		60	ns

Spice Model

NPN (Is=14.34f Xti=3 Eg=1.11 Vaf=74.03 Bf=255.9 Ne=1.307 Ise=14.34f Ikf=.2847 Xtb=1.5 Br=6.092 Nc=2 Isc=0 Ikr=0 Rc=1 Cjc=7.306p Mjc=.3416 Vjc=.75 Fc=.5 Cje=22.01p Mje=.377 Vje=.75 Tr=46.91n Tf=411.1p Itf=.6 Vtf=1.7 Xtf=3 Rb=10)

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