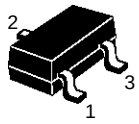
SGS-THOMSON MICROELECTRONICS

BC857/BC858 BC859/BC860

SMALL SIGNAL PNP TRANSISTORS

Type	Marking
BC857A	3E
BC857B	3F
BC858A	3J
BC858B	3K
BC859A	4A
BC859B	4B
BC860A	4E
BC860B	4F

- SILICON EPITAXIAL PLANAR PNP TRANSISTORS
- MINIATURE PLASTIC PACKAGE FOR APPLICATION IN SURFACE MOUNTING CIRCUITS
- VERY LOW NOISE AF AMPLIFIER
- NPN COMPLEMENTS FOR BC857 AND BC858 ARE RESPECTIVELY BC847 AND BC848



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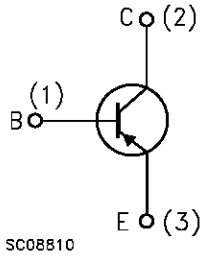
INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		BC857/BC860	BC858/BC859	
V_{CES}	Collector-Emitter Voltage (V_{BE} = 0)	-50	-30	V
V_{CBO}	Collector-Base Voltage (I_E = 0)	-50	-30	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)	-45	-30	V
V_{EBO}	Emitter-Base Voltage (I_C = 0)	-5		V
I_C	Collector Current	-0.1		A
I_{CM}	Collector Peak Current	-0.2		A
I_{BM}	Base Peak Current	-0.2		A
I_{EM}	Emitter Peak Current	-0.2		A
P_{tot}	Total Dissipation at T_c = 25 °C	300		mW
T_{stg}	Storage Temperature	-65 to 150		°C
T_j	Max. Operating Junction Temperature	150		°C

THERMAL DATA

$R_{thj\text{-}amb}$ •	Thermal Resistance Junction-Ambient	Max	420	°C/W
$R_{thj\text{-}SR}$ •	Thermal Resistance Junction-Substrate	Max	330	°C/W

• Mounted on a ceramic substrate area = 10 x 8 x 0.6 mm

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_E = 0)	V_{CE} = -30 V V_{CE} = -30 V T_{amb} = 150 °C			-15 -5	nA µA
$V_{(BR)CES}$*	Collector-Emitter Breakdown Voltage (V_{BE} = 0)	I_C = -10 µA for **BC857/BC860** for **BC858/BC859**	 -50 -30			 V V
$V_{(BR)CBO}$*	Collector-Base Breakdown Voltage (I_E = 0)	I_C = -10 µA for **BC857/BC860** for **BC858/BC859**	 -50 -30			 V V
$V_{(BR)CEO}$*	Collector-Emitter Breakdown Voltage (I_B = 0)	I_C = -2 mA for **BC857/BC860** for **BC858/BC859**	 -45 -30			 V V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage (I_C = 0)	I_C = -10 µA for **BC857** for **BC858/BC859/BC860**	 -6 -5			 V V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = -10 mA I_B = -0.5 mA I_C = -100 mA I_B = -5 mA		-0.09 -0.25	-0.3 -0.65	V V
$V_{BE(sat)}$*	Base-Emitter Saturation Voltage	I_C = -10 mA I_B = -0.5 mA I_C = -100 mA I_B = -5 mA		-0.75 -0.9		V V
$V_{BE(on)}$*	Base-Emitter On Voltage	I_C = -2 mA V_{CE} = -5 V I_C = -10 mA V_{CE} = -5 V	-0.6	-0.66 -0.72	-0.75 -0.82	V V
h_{FE}	DC Current Gain	I_C = -10 µA V_{CE} = -5 V for **group A** for **group B** I_C = -2 mA V_{CE} = -5 V for **group A** for **group B**	 110 200	 90 150 180 290	 220 450	
f_T	Transition Frequency	I_C = -10 mA V_{CE} = -5 V f = 100MHz		150		MHz
C_{CB}	Collector Base Capacitance	I_E = 0 V_{CB} = -10 V f = 1 MHz			6	pF
NF	Noise Figure	V_{CE} = -5 V I_C = -0.2 mA f = 1KHz Δf = 200 Hz R_G = 2 KΩ for **BC857/BC858** for **BC859/BC860** V_{CE} = -5 V I_C = -0.2 mA f = 30 to 15000 Hz R_G = 2 KΩ for **BC859** for **BC860**	 	 2 1.2 1.4 1.4	 10 4 4 2	 dB dB dB dB
V_N	Noise Equivalent Voltage	V_{CE} = -5 V I_C = -0.2 mA f = 10 to 50Hz R_G = 2 KΩ for **BC860 only**			-0.11	µV

* Pulsed: Pulse duration = 300 µs, duty cycle ≤ 2 %

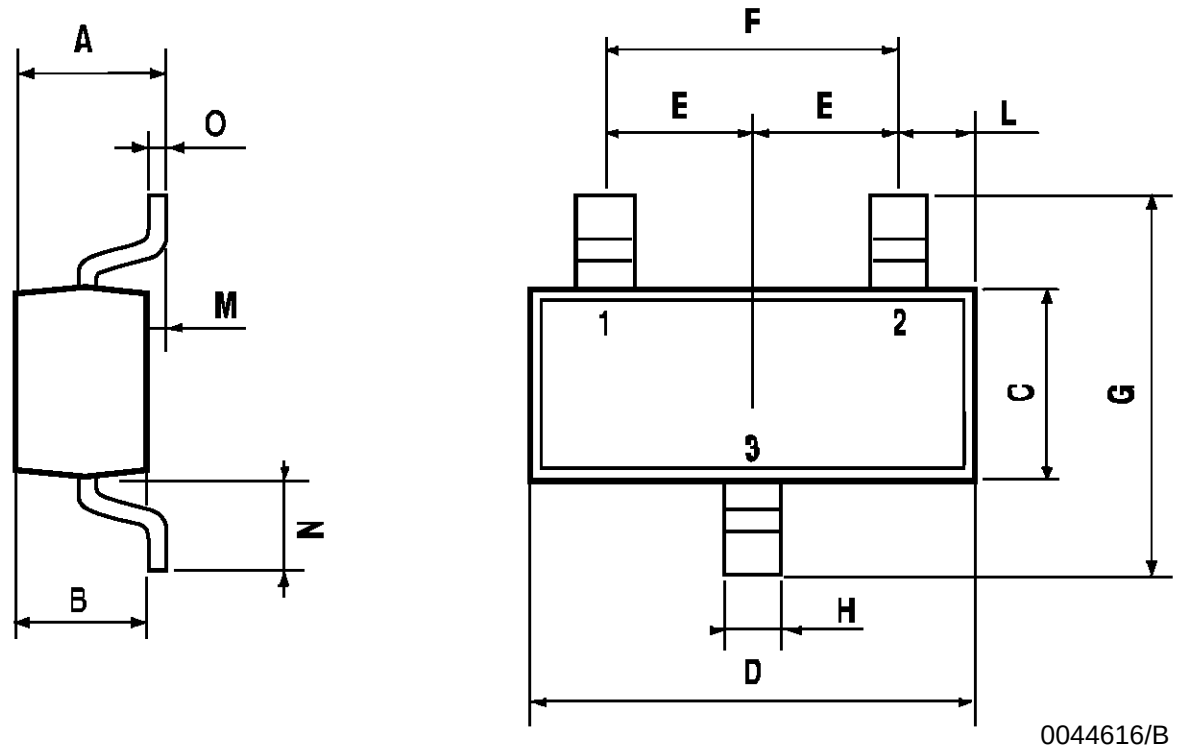
ELECTRICAL CHARACTERISTICS (Continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
h_{ie}	Input Impedance	V_{CE} = -5 V I_C = -2 mA f = 1KHz for **group A** for **group B**	 1.6 3.2	 2.7 4.5	 4.5 8.5	 KΩ KΩ
h_{re}	Reverse Voltage Ratio	V_{CE} = -5 V I_C = -2 mA f = 1KHz for **group A** for **group B**		 1.5 2		 10^{-4} 10^{-4}
h_{fe}	Small Signal Current Gain	V_{CE} = -5 V I_C = -2 mA f = 1KHz for **group A** for **group B**		 220 330		
h_{oe}	Output Admittance	V_{CE} = -5 V I_C = -2 mA f = 1KHz for **group A** for **group B**		 18 30	 30 60	 µs µs

∗ Pulsed: Pulse duration = 300 µs, duty cycle ≤ 2 %

SOT-23 MECHANICAL DATA

DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	0.85		1.1	33.4		43.3
B	0.65		0.95	25.6		37.4
C	1.20		1.4	47.2		55.1
D	2.80		3	110.2		118
E	0.95		1.05	37.4		41.3
F	1.9		2.05	74.8		80.7
G	2.1		2.5	82.6		98.4
H	0.38		0.48	14.9		18.8
L	0.3		0.6	11.8		23.6
M	0		0.1	0		3.9
N	0.3		0.65	11.8		25.6
O	0.09		0.17	3.5		6.7



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