

NPN BCY58 – BCY59

SILICON PLANAR EPITAXIAL TRANSISTORS

The BCY58 and BCY59 are NPN transistors mounted in TO-18 metal package with the collector connected to the case .

They are designed for use in audio drive and low-noise input stages.

Compliance to RoHS.

ABSOLUTE MAXIMUM RATINGS

Symbol	Ratings		Value	Unit
V_{CEO}	Collector-Emitter Voltage(1)	BCY59	45	V
		BCY58	32	
V_{CES}	Collector-Emitter Voltage ($V_{BE} = 0$)	BCY59	45	V
		BCY58	32	
V_{EBO}	Emitter-Base Voltage	BCY59	7	V
		BCY58	7	
I_C	Collector Current	BCY59	200	mA
		BCY58		
I_B	Base Current	BCY59	50	mA
		BCY58		
P_D	Total Power Dissipation	@ $T_{amb} = 45^\circ$	0.39	mW
		BCY59		
P_D	Total Power Dissipation	@ $T_{case} = 45^\circ$	1	Watts
		BCY59		
T_J	Junction Temperature	BCY59	200	$^\circ C$
		BCY58		
T_{Stg}	Storage Temperature range	BCY59	-65 to +150	$^\circ C$
		BCY58		

(1) Applicable up to $I_C = 500mA$

THERMAL CHARACTERISTICS

Symbol	Ratings	Value	Unit
R_{thJ-a}	Thermal Resistance, Junction to mounting base	450	$^\circ C/W$
R_{thJ-c}	Thermal Resistance, Junction to ambient in free air	150	$^\circ C/W$

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ELECTRICAL CHARACTERISTICS

T_j=25°C unless otherwise specified

Symbol	Ratings	Test Condition(s)	Min	Typ	Max	Unit
I _{CES}	Collector Cutoff Current	V _{CB} =45 V V _{BE} =0V	-	-	10	nA
		BCY59				
I _{CES}	Collector Cutoff Current	V _{CB} =32 V V _B =0V	-	-	10	μA
		BCY58				
I _{CEO}	Emitter Cutoff Current	V _{CB} =45 V V _{BE} =0V, T _{amb} =150°C	-	-	10	nA
		BCY59				
I _{CEO}	Emitter Cutoff Current	V _{CB} =32 V, V _{BE} =0 T _{amb} =150°C	-	-	10	μA
		BCY58				
I _{EBO}	Emitter Cutoff Current	V _{BE} =5.0 V I _C =0	-	-	10	nA
		BCY59				
V _{CEO}	Collector Emitter Breakdown Voltage	I _C =2 mA, I _B =0	45	-	-	V
		BCY59				
V _{CEO}	Collector Emitter Breakdown Voltage	I _C =2 mA, I _B =0	32	-	-	V
		BCY58				
V _{EBO}	Emitter Base Breakdown Voltage	I _E =1μA, I _C =0	7	-	-	V
		BCY59				
V _{EBO}	Emitter Base Breakdown Voltage	I _E =1μA, I _C =0	7	-	-	V
		BCY58				
V _{CE(SAT)}	Collector-Emitter saturation Voltage	I _C =10 mA I _B =0.25 mA	-	0.12	0.25	V
		BCY59				
		BCY58				
		I _C =100 mA I _B =2.5 mA				
V _{CE(SAT)}	Collector-Emitter saturation Voltage	I _C =100 mA I _B =2.5 mA	-	04	08	V
		BCY59				
		BCY58				
		I _C =10 mA I _B =0.25 mA				
V _{BE(SAT)}	Base-Emitter Saturation Voltage	I _C =10 mA I _B =0.25 mA	0.6	0.7	0.85	V
		BCY59				
		BCY58				
		I _C =100 mA I _B =2.5 mA				
V _{BE(SAT)}	Base-Emitter Saturation Voltage	I _C =100 mA I _B =2.5 mA	0.7	0.85	1.2	V
		BCY59				
		BCY58				
		I _C =10 mA I _B =0.25 mA				
V _{BE}	Base-Emitter Voltage	I _C =10 μA, V _{CE} =5 V	-	0.5	-	V
		BCY59				
		BCY58				
		V _{CE} =V _{CE max} I _C =20 μA, T _j =100°C				
		BCY59				
		BCY58				
		I _C =2 mA, V _{CE} =5 V				
		BCY59				
BCY58						
V _{BE}	Base-Emitter Voltage	I _C =10 mA, V _{CE} =1 V	-	0.7	-	V
		BCY59				
		BCY58				
		I _C =100 mA, V _{CE} =1 V				
V _{BE}	Base-Emitter Voltage	I _C =100 mA, V _{CE} =1 V	-	0.76	-	V
		BCY59				
V _{BE}	Base-Emitter Voltage	I _C =100 mA, V _{CE} =1 V	-	0.76	-	V
		BCY58				

Symbol	Ratings	Test Condition(s)	BCY59VII	BCY59VIII	BCY59IX	BCY59X
			BCY58VII	BCY58VIII	BCY58IX	BCY58X
h _{FE}	DC Current Gain	I _C =10 μA, V _{CE} =5 V	-	>20	>40	>60
		Typ.20	Typ.95	Typ.190	Typ.300	
		I _C =2 mA, V _{CE} =5 V	>120	>180	>250	>380
		<220	<310	<460	<630	
		I _C =10 mA, V _{CE} =1 V	>80	>120	>160	>240
h _{fe}	Small-Signal Current Gain	I _C =100 mA, V _{CE} =1V	-	<400	<630	<1000
		>40	>45	>60	>60	
		I _C =2 mA, V _{CE} =5 V, f = 1kHz	>125	>175	>250	>350
		<250	<350	<500	<700	

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ELECTRICAL CHARACTERISTICS

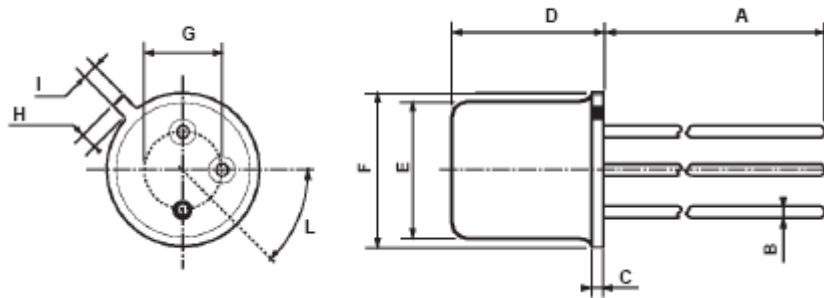
T_j=25°C unless otherwise specified

Symbol	Ratings	Test Condition(s)	Min	Typ	Mx	Unit		
f _T	Transition frequency	I _C =10 mA, V _{CE} =5 V f = 100MHz	BCY59	150	-	-	MHz	
			BCY58					
F	Noise figure , RS=2kΩ	I _C =200 μA, V _{CE} =5 V f = 1kHz, B =200Hz	BCY59	-	2	6	db	
			BCY58					
t _d	Delay time	I _C =10 mA , I _B =1 mA -I _{BM} =1 mA, V _{BB} =3.6 V R1= R2 = 5kΩ R _L = 990 Ω	BCY59	-	35	-	ns	
t _r	Rise time		BCY58					
t _{on}	Turn on time		BCY59	-	85	150		ns
t _s	Storage time		BCY59	-	400	-		ns
t _f	Fall time		BCY59	-	80	-		ns
t _{off}	Turn off time		BCY59	-	480	800		ns
t _d	Delay time	I _C =100 mA , I _B =10 mA -I _{BM} =10 mA, V _{BB} =5 V R1 = 500Ω , R1 = 700Ω R _L = 990 Ω	BCY59	-	5	-	ns	
t _r	Rise time		BCY58					
t _{on}	Turn on time		BCY59	-	55	150		ns
t _s	Storage time		BCY59	-	250	-		ns
t _f	Fall time		BCY59	-	200	-		ns
t _{off}	Turn off time		BCY59	-	450	800		ns
C _C	Collector capacitance	I _E = I _e = 0 , V _{CB} =10 V f = 1MHz	BCY59	-	-	5	pF	
			BCY58					
C _E	Emitter capacitance	I _C = I _c = 0 , V _{EB} =0.5 V f = 1MHz	BCY59	-	-	15	pF	
			BCY58					

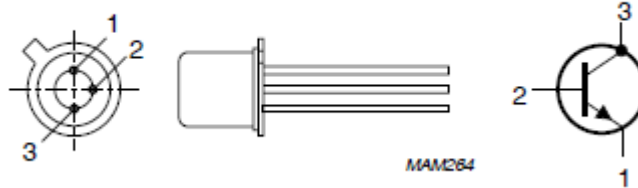
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MECHANICAL DATA CASE TO-18

DIMENSIONS (mm)		
	min	max
A	12.7	-
B	-	0.49
C	0.9	-
D	-	5.3
E	-	4.9
F	-	5.8
G	2.54	-
H	-	1.2
I	-	1.16
L	45°	-



Pin 1 :	emitter
Pin 2 :	base
Pin 3 :	Collector
Case :	Collector



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