BD707/709/711
BD708/712

COMPLEMENTARY SILICON POWER TRANSISTORS

- COMPLEMENTARY PNP - NPN DEVICES

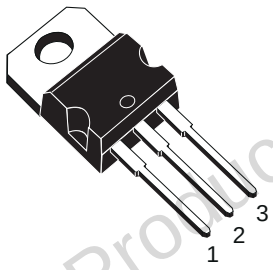
APPLICATION

- LINEAR AND SWITCHING INDUSTRIAL EQUIPMENT

DESCRIPTION

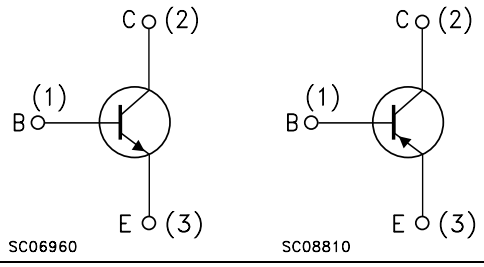
The BD707, BD709 and BD711 are silicon Epitaxial-Base NPN power transistors in Jedec TO-220 plastic package. They are intented for use in power linear and switching applications.

The BD707 and BD711 complementary PNP types are BD708 and BD712 respectively.



TO-220

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter		Value			Unit
		NPN	BD707	BD709	BD711	
		PNP	BD708		BD712	
V_{CBO}	Collector-Base Voltage (I_E = 0)		60	80	100	V
V_{CER}	Collector-Emitter Voltage (V_{BE} = 0)		60	80	100	V
V_{CEO}	Collector-Emitter Voltage (I_B = 0)		60	80	100	V
V_{EBO}	Emitter-Base Voltage (I_C = 0)		5			V
I_C	Collector Current		12			A
I_{CM}	Collector Peak Current		18			A
I_B	Base Current		5			A
P_{tot}	Total Dissipation at $T_c \leq 25\ ^oC$		75			W
T_{stg}	Storage Temperature		-65 to 150			^oC
T_j	Max. Operating Junction Temperature		150			^oC

For PNP types voltage and current values are negative

THERMAL DATA

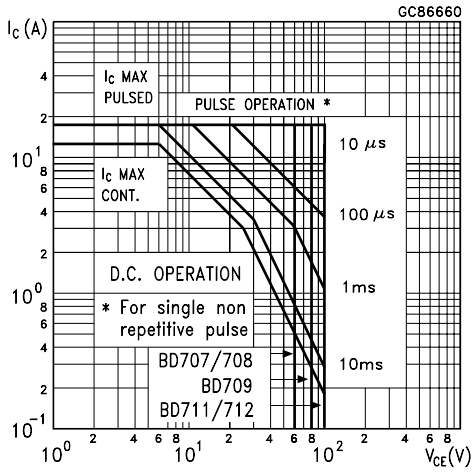
$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	1.67	°C/W
$R_{thj\text{-}case}$	Thermal Resistance Junction-ambient	Max	70	°C/W

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

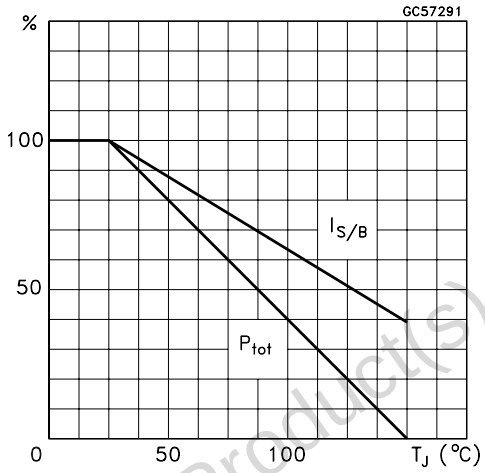
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cut-off Current (I_E = 0)	for **BD707/708** for **BD709** for **BD711/712** T_{case} = 150 °C for **BD707/708** for **BD709** for **BD711/712**	V_{CB} = 60 V V_{CB} = 80 V V_{CB} = 100 V V_{CB} = 60 V V_{CB} = 80 V V_{CB} = 100 V			100 100 100 1 1 1	µA µA µA mA mA mA
I_{CEO}	Collector Cut-off Current (I_B = 0)	for **BD707/708** for **BD709** for **BD711/712**	V_{CE} = 30 V V_{CE} = 40 V V_{CE} = 50 V			100 100 100	mA mA mA
I_{EBO}	Emitter Cut-off Current (I_C = 0)	V_{EB} = 5 V				1	mA
$V_{CEO(sus)}$*	Collector-Emitter Sustaining Voltage (I_B = 0)	I_C = 100 mA for **BD707/708** for **BD709** for **BD711/712**		 60 80 100			 V V V
$V_{CE(sat)}$*	Collector-Emitter Saturation Voltage	I_C = 4 A	I_B = 0.4 A			1	V
V_{CEK}*	Knee Voltage	I_C = 3 A	I_B = **			0.4	V
V_{BE}*	Base-Emitter Voltage	I_C = 4 A	V_{CE} = 4 V			1.5	V
h_{FE}*	DC Current Gain	I_C = 0.5 A I_C = 2 A I_C = 4 A I_C = 10 A 	V_{CE} = 2 V V_{CE} = 2 V for **BD707/708** for **BD709** V_{CE} = 4 V V_{CE} = 4 V for **BD707/708** for **BD709** for **BD711/712**	40 30 30 15 5 	120 10 8 8	400 150 	
f_T	Transition frequency	I_C = 300 mA	V_{CE} = 3 V	3			MHz

* Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %
** Value for which I_C = 3.3 A at V_{CE} = 2V.
For PNP types voltage and current values are negative.

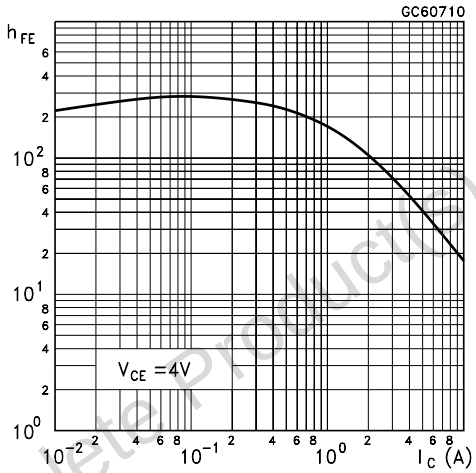
Safe Operating Areas



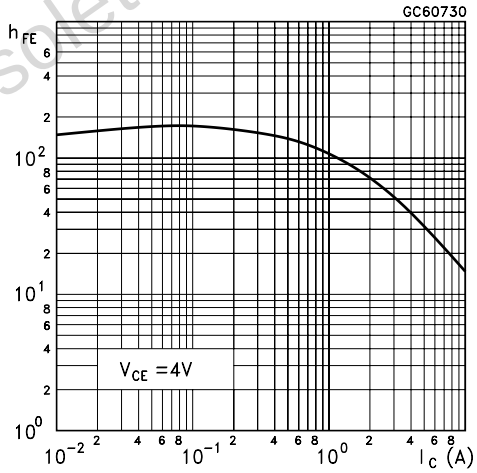
Derating Curve



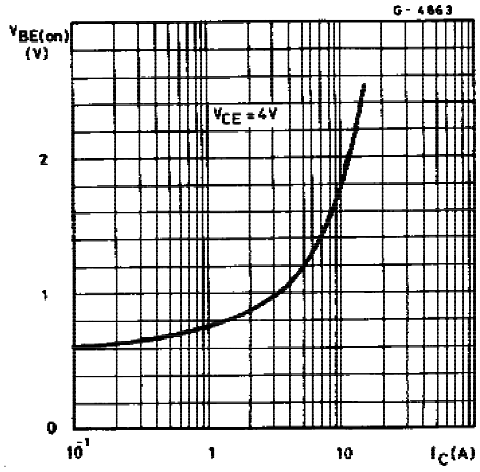
DC Current Gain(NPN type)



DC Current Gain(PNP type)



DC Transconductance(NPN type)



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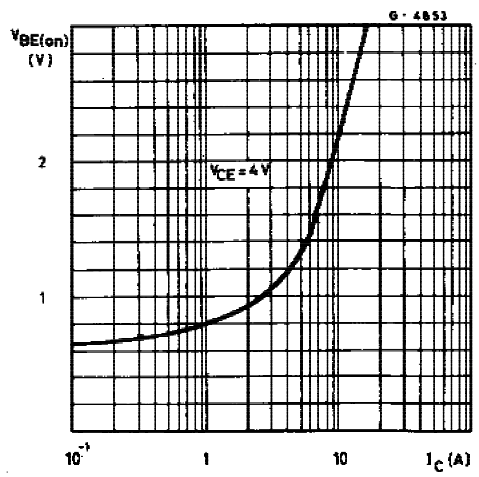
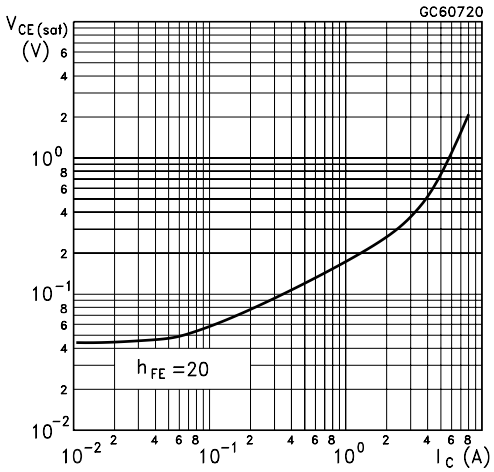


Collector-Emitter Saturation Voltage (NPN type)



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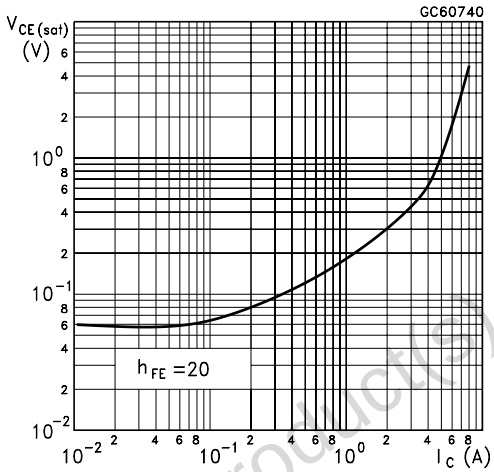
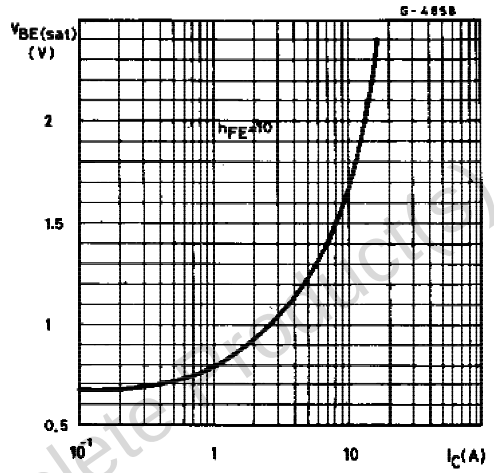


Base-Emitter Saturation Voltage (NPN type)



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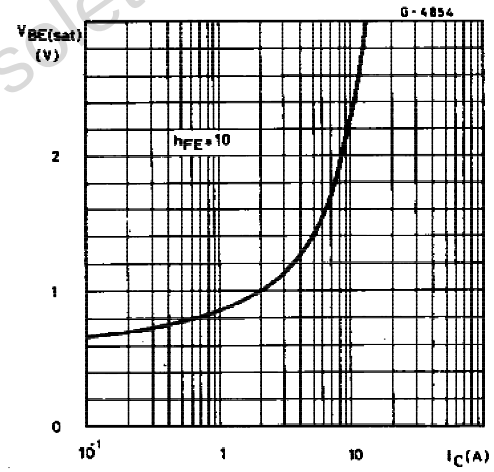
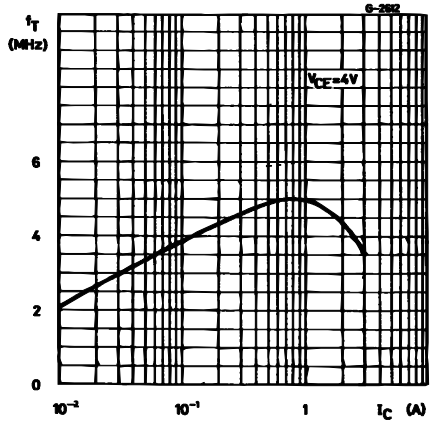
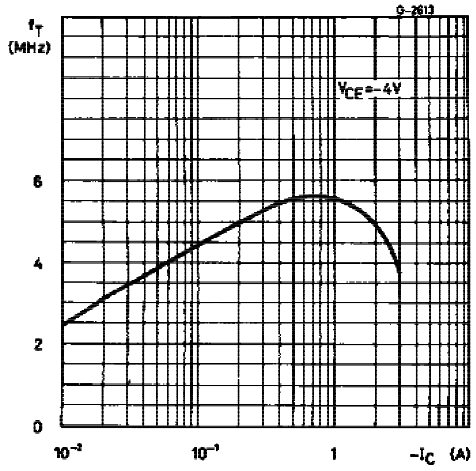


Transition Frequency (NPN type)

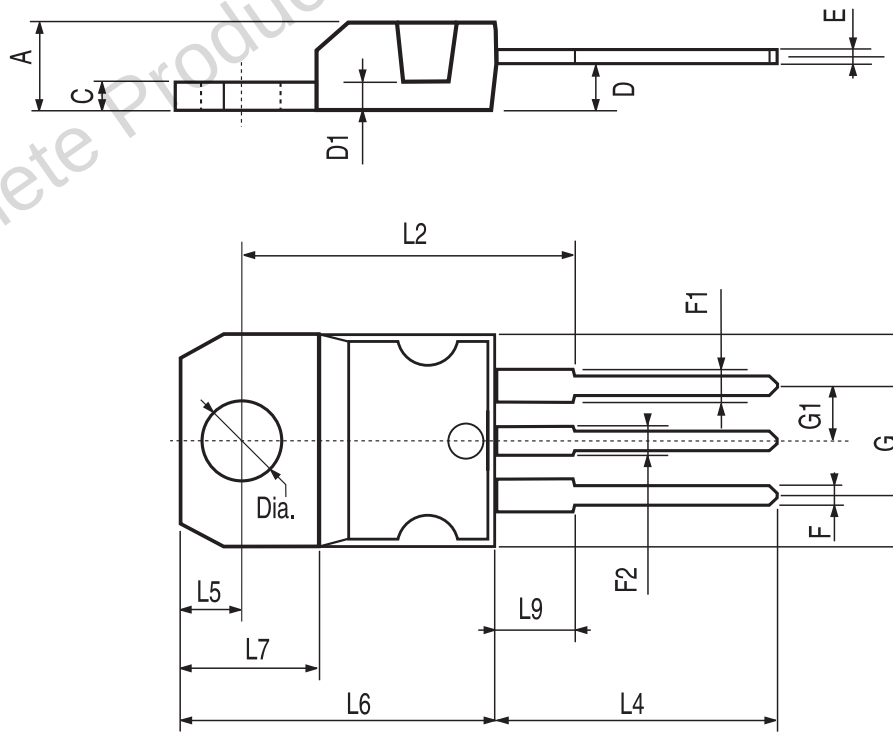


Transition Frequency (PNP type)



TO-220 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.40		4.60	0.173		0.181
C	1.23		1.32	0.048		0.051
D	2.40		2.72	0.094		0.107
D1		1.27			0.050	
E	0.49		0.70	0.019		0.027
F	0.61		0.88	0.024		0.034
F1	1.14		1.70	0.044		0.067
F2	1.14		1.70	0.044		0.067
G	4.95		5.15	0.194		0.203
G1	2.4		2.7	0.094		0.106
H2	10.0		10.40	0.393		0.409
L2		16.4			0.645	
L4	13.0		14.0	0.511		0.551
L5	2.65		2.95	0.104		0.116
L6	15.25		15.75	0.600		0.620
L7	6.2		6.6	0.244		0.260
L9	3.5		3.93	0.137		0.154
DIA.	3.75		3.85	0.147		0.151



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