SGS-THOMSON MICROELECTRONICS

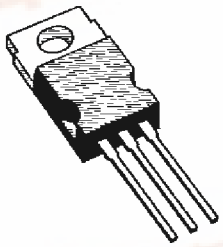
BD705/706/707/708
BD709/710/711/712

S G S-THOMSON 30E D

POWER LINEAR AND SWITCHING APPLICATIONS

DESCRIPTION

The BD705, BD707, BD709 and BD711 are silicon epitaxial-base NPN power transistors in Jedec TO-220 plastic package intended for use in power linear and switching applications. The complementary PNP types are the BD706, BD708, BD710 and BD712 respectively.



TO-220

INTERNAL SCHEMATIC DIAGRAMS

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN PNP*	Value				Unit
			BD705 BD706	BD707 BD708	BD709 BD710	BD711 BD712	
V_{CBO}	Collector-emitter Voltage ($I_E = 0$)		45	60	80	100	V
V_{CES}	Collector-emitter Voltage ($V_{BE} = 0$)		45	60	80	100	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)		45	60	80	100	V
V_{EBO}	Emitter-base Voltage ($I_C = 0$)		5				V
I_C	Collector Current		12				A
I_B	Base Current		5				A
P_{tot}	Total Power Dissipation at $T_{case} \leq 25$ °C		75				W
T_{stg}	Storage Temperature		– 65 to 150				°C
T_j	Junction Temperature		150				°C

For PNP types voltage and current values are negative.

THERMAL DATA

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

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

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current (I_E = 0)	for **BD705/706**	V_{CB} = 45 V			100	µA
		for **BD707/708**	V_{CB} = 60 V			100	µA
		for **BD709/710**	V_{CB} = 80 V			100	µA
		for **BD711/712**	V_{CB} = 100 V			100	µA
		T_{case} = 150 °C					
		for **BD705/706**	V_{CB} = 45 V			1	mA
		for **BD707/708**	V_{CB} = 60 V			1	mA
		for **BD709/710**	V_{CB} = 80 V			1	mA
		for **BD711/712**	V_{CB} = 100 V			1	mA
I_{CEO}	Collector Cutoff Current (I_B = 0)	for **BD705/706**	V_{CE} = 22 V			1	mA
		for **BD707/708**	V_{CE} = 30 V			1	mA
		for **BD709/710**	V_{CE} = 40 V			1	mA
		for **BD711/712**	V_{CE} = 50 V			1	mA
I_{EBO}	Emitter Cutoff 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 **BD705/706**	45			V
			for **BD707/708**	60			V
			for **BD709/710**	80			V
			for **BD711/712**	100			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	V_{CE} = 2 V	40	120	400	
		I_C = 2 A	V_{CE} = 2 V				
			for **BD705/706**	30			
			for **BD707/708**	30			
			for **BD709/710**	30			
		I_C = 4 A	V_{CE} = 4 V				
			for **BD705/706**	20	30	150	
			for **BD707/708**	15		150	
			for **BD709/710**	15		150	
			for **BD711/712**	15		150	
		I_C = 10 A	V_{CE} = 4 V				
			for **BD705/706**	5	10		
			for **BD707/708**	5	10		
			for **BD709/710**		8		
			for **BD711/712**		8		
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 = 3.3A at V_{CE} = 2V.
For PNP types voltage and current values are negative.

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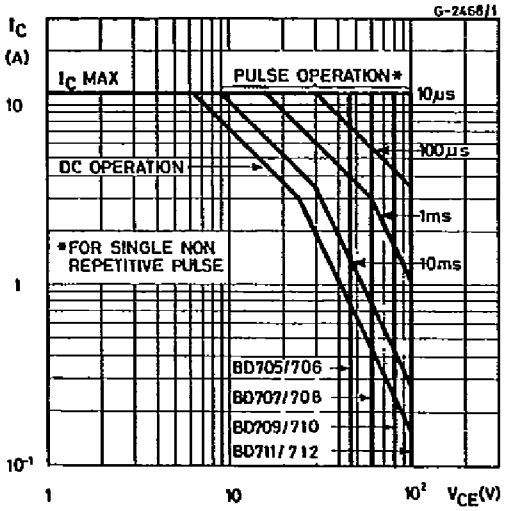
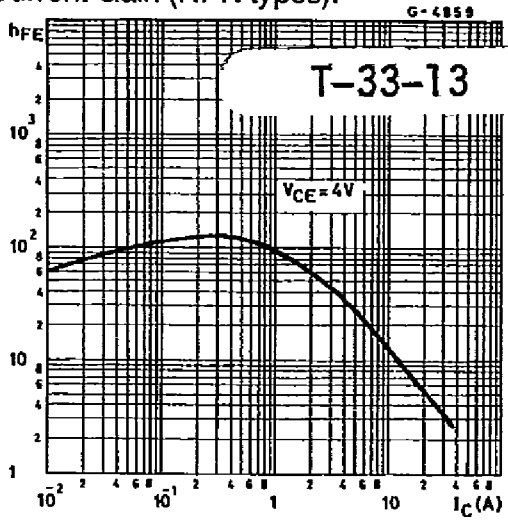
Safe Operating Areas.



DC Current Gain (NPN types).



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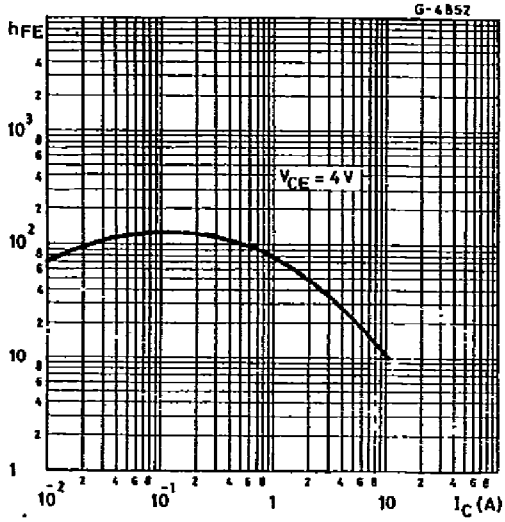
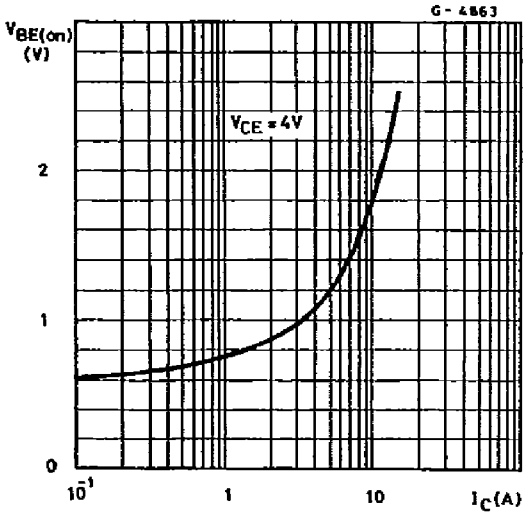


DC Transconductance (NPN types).



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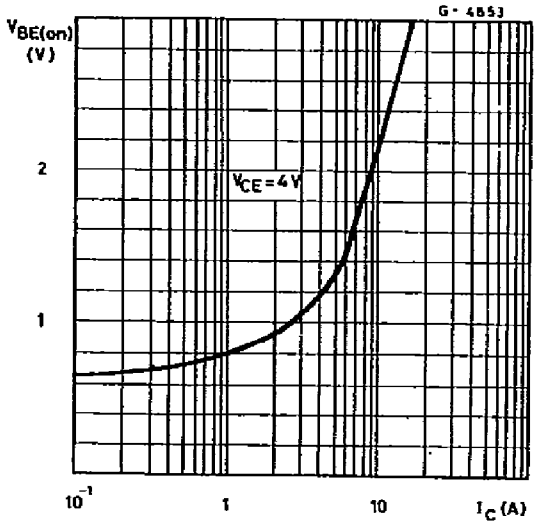
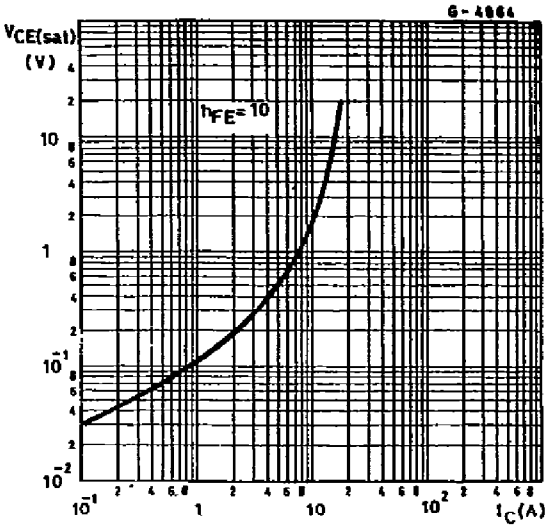


Collector-emitter Saturation Voltage (NPN types).



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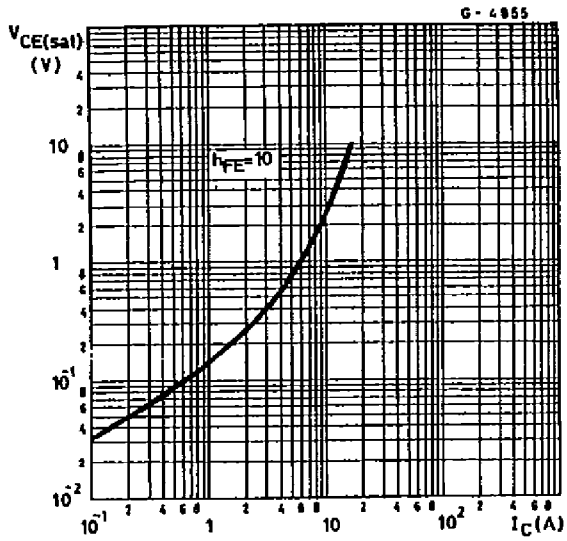
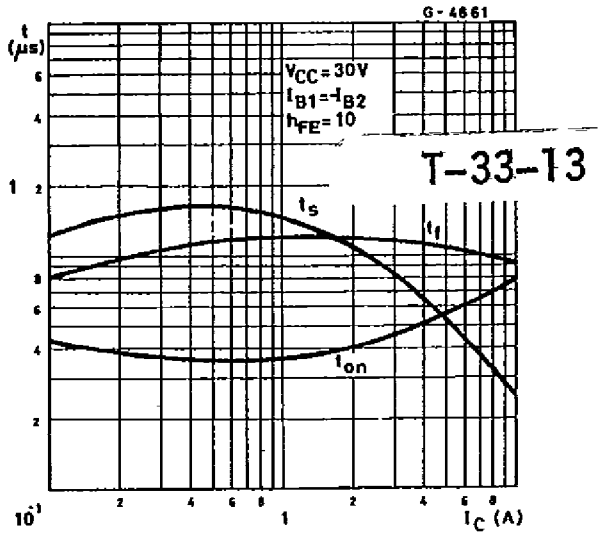


Saturated Switching Characteristics (NPN types



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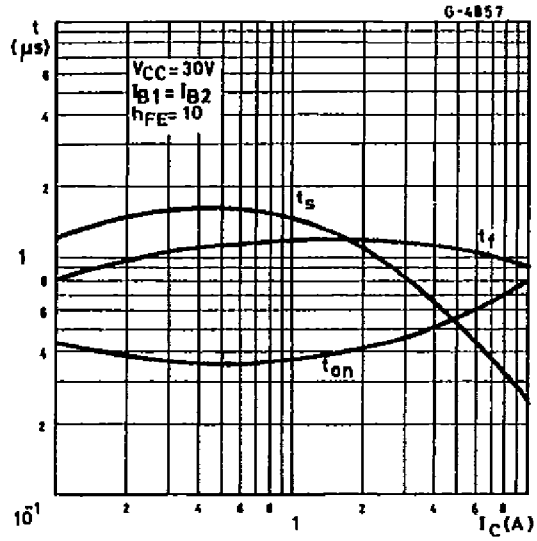
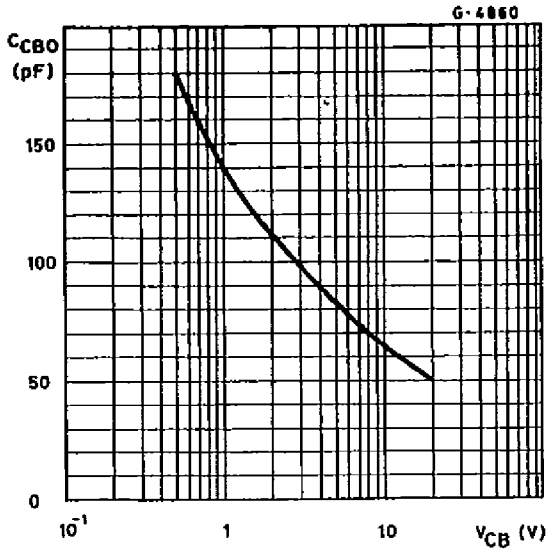


Collector-base Capacitance (NPN types).



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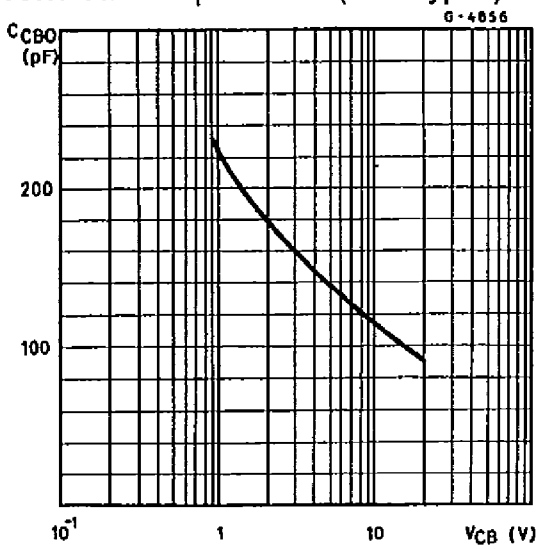
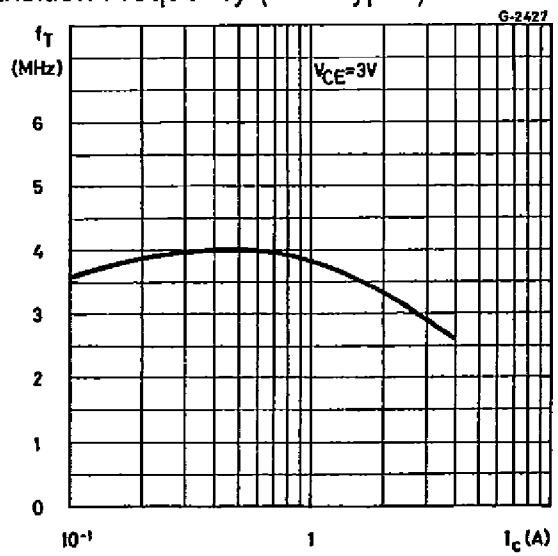


Transition Frequency (NPN types).



Transition Frequency (PNP types). SGS