



EPITAXIAL-BASE NPN/PNP

POWER LINEAR AND SWITCHING APPLICATIONS

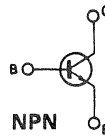
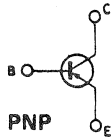
The BDW 51, BDW 51A, BDW 51B and BDW 51C are silicon epitaxial-base NPN power transistors in Jedec TO-3 metal case. They are intended for use in power linear and switching applications.

The complementary PNP types are the BDW 52, BDW 52A, BDW 52B and BDW 52C respectively.

ABSOLUTE MAXIMUM RATINGS		NPN PNP*	BDW51 BDW52	BDW51A BDW52A	BDW51B BDW52B	BDW51C BDW52C
V_{CBO}	Collector-base voltage ($I_E = 0$)		45V	60V	80V	100V
V_{CES}	Collector-emitter voltage ($V_{BE} = 0$)		45V	60V	80V	100V
V_{CEO}	Collector-emitter voltage ($I_B = 0$)		45V	60V	80V	100V
V_{EBO}	Emitter-base voltage ($I_C = 0$)				5V	
I_C	Collector current				15A	
I_{CM}	Collector peak current (repetitive)				20A	
I_B	Base current				7A	
P_{tot}	Total power dissipation at $T_{case} \leq 25^\circ C$				125W	
T_{stg}	Storage temperature				-65 to $200^\circ C$	
T_j	Junction temperature				$200^\circ C$	

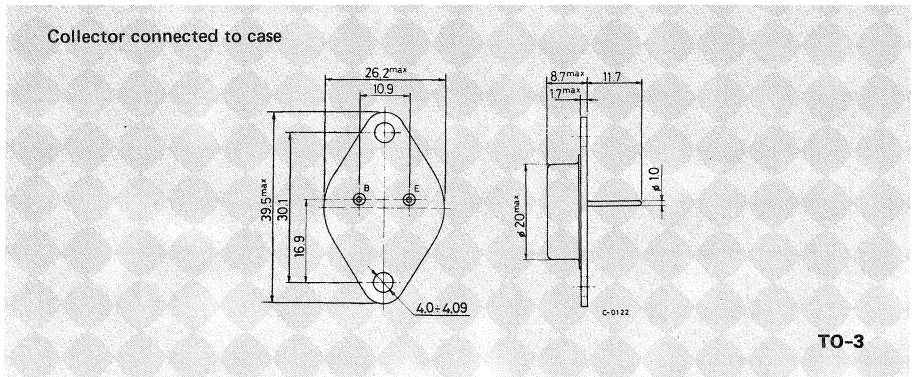
* For PNP types voltage and current values are negative

INTERNAL SCHEMATIC DIAGRAMS



MECHANICAL DATA

Dimensions in mm





BDW51 BDW52
 BDW51A BDW52A
 BDW51B BDW52B
 BDW51C BDW52C

THERMAL DATA

$R_{th\ j-case}$	Thermal resistance junction-case	max	1.4	$^{\circ}C/W$
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ELECTRICAL CHARACTERISTICS ($T_{case} = 25^{\circ}C$ unless otherwise specified)

Parameter	Test conditions	Min.	Typ.	Max.	Unit	
I_{CBO} Collector cutoff current ($I_E = 0$)	for BDW51/52	$V_{CB} = 45V$	500		μA	
	for BDW51A/52A	$V_{CB} = 60V$	500		μA	
	for BDW51B/52B	$V_{CB} = 80V$	500		μA	
	for BDW51C/52C	$V_{CB} = 100V$	500		μA	
	$T_{case} = 150^{\circ}C$					
	for BDW51/52	$V_{CB} = 45V$	5		mA	
I_{CEO} Collector cutoff current ($I_B = 0$)	for BDW51/52	$V_{CE} = 22V$	1		mA	
	for BDW51A/52A	$V_{CE} = 30V$	1		mA	
	for BDW51B/52B	$V_{CE} = 40V$	1		mA	
	for BDW51C/52C	$V_{CE} = 50V$	1		mA	
I_{EBO} Emitter cutoff current ($I_C = 0$)	$V_{EB} = 5V$		2		mA	
$V_{CEO(sus)}$ * Collector-emitter sustaining voltage ($I_B = 0$)	$I_C = 100\text{ mA}$					
	for BDW51/52		45		V	
	for BDW51A/52A		60		V	
	for BDW51B/52B		80		V	
for BDW51C/52C		100		V		
$V_{CE(sat)}$ * Collector-emitter saturation voltage	$I_C = 5A$	$I_B = 0.5A$	1		V	
	$I_C = 10A$	$I_B = 2.5A$	3		V	
$V_{BE(sat)}$ * Base-emitter saturation voltage	$I_C = 10A$	$I_B = 2.5A$	2.5		V	
V_{BE} * Base-emitter voltage	$I_C = 5A$	$V_{CE} = 4V$	1.5		V	
h_{FE} * DC current gain	$I_C = 5A$	$V_{CE} = 4V$	20	150	—	
	$I_C = 10A$	$V_{CE} = 4V$	5		—	
f_T Transition frequency	$I_C = 0.5A$	$V_{CE} = 4V$	3		MHz	

* Pulsed: pulse duration = 300 μs , duty cycle = 1.5%

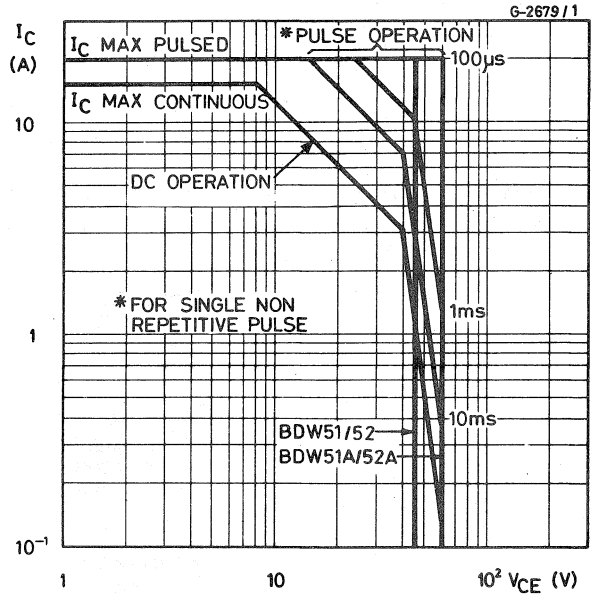
For PNP types voltage and current values are negative.



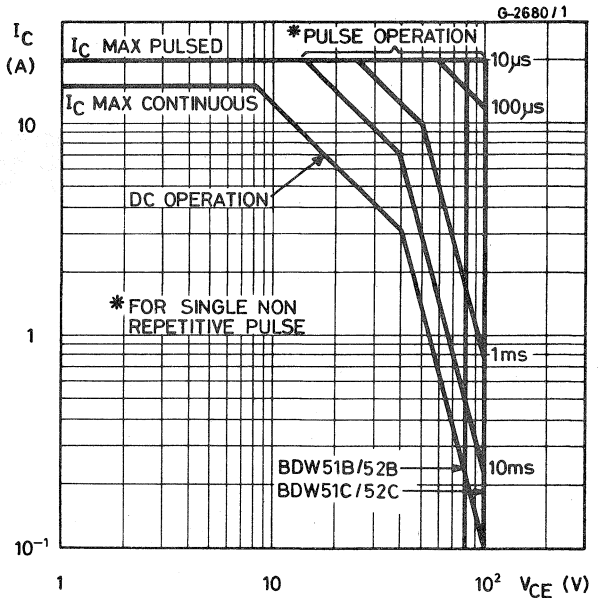
BDW51
BDW51A
BDW51B
BDW51C

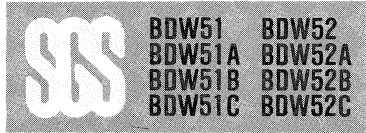
BDW52
BDW52A
BDW52B
BDW52C

Safe operating areas
(for BDW51, BDW51A,
BDW52, BDW52A).

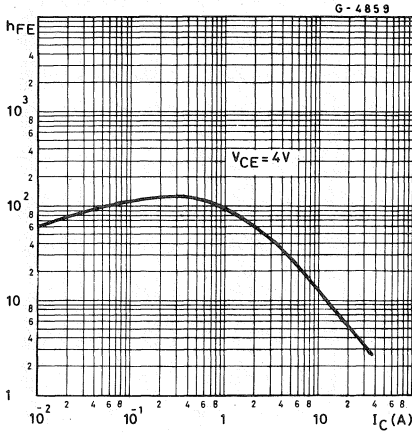


Safe operating areas
(for BDW51B, BDW51C,
BDW52B, BDW52C).

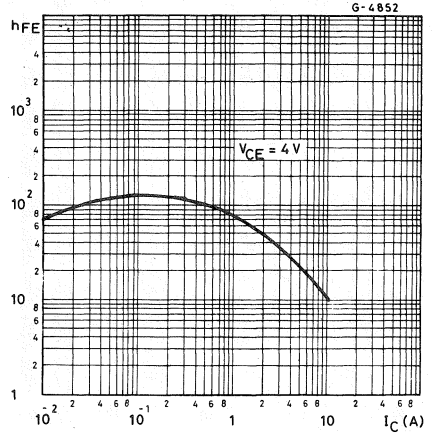




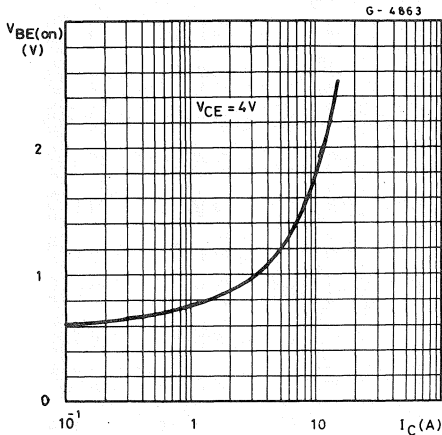
DC current gain (NPN types)



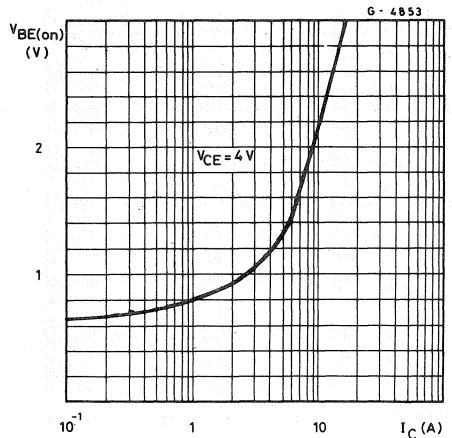
DC current gain (PNP types)



DC transconductance (NPN types)

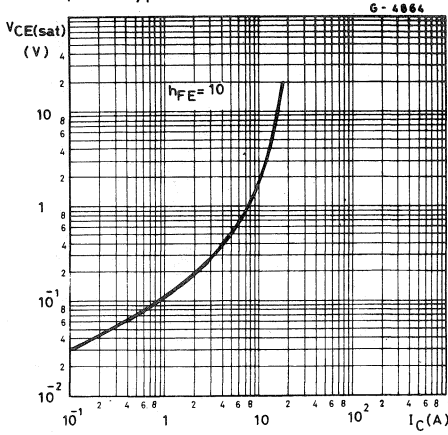


DC transconductance (PNP types)

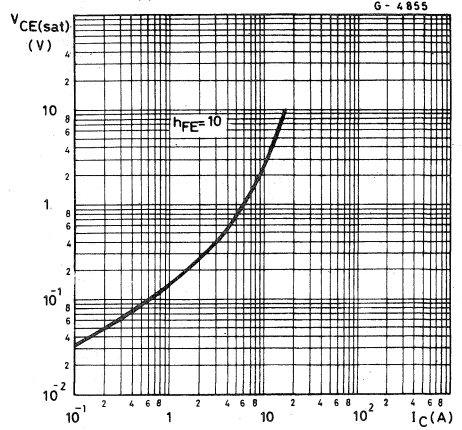




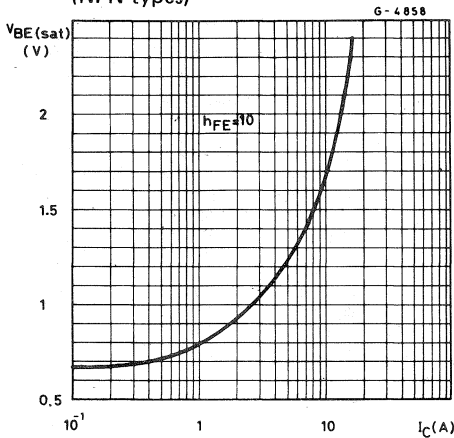
Collector-emitter saturation voltage (NPN types)



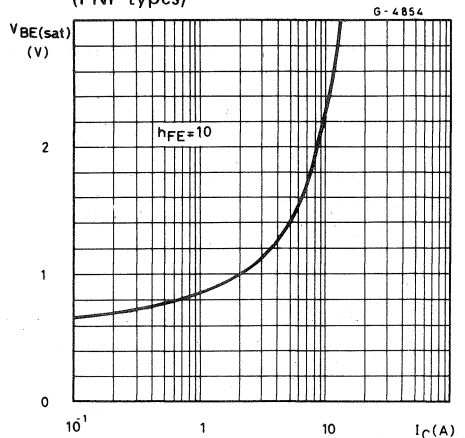
Collector-emitter saturation voltage (PNP types)



Base-emitter saturation voltage (NPN types)



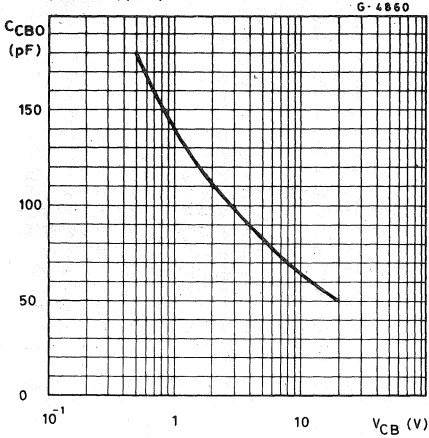
Base-emitter saturation voltage (PNP types)



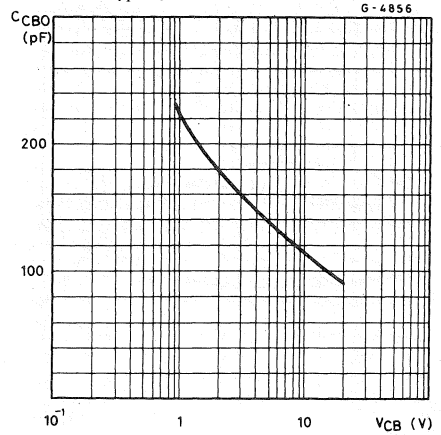


BDW51
BDW51A
BDW51B
BDW51C
BDW52
BDW52A
BDW52B
BDW52C

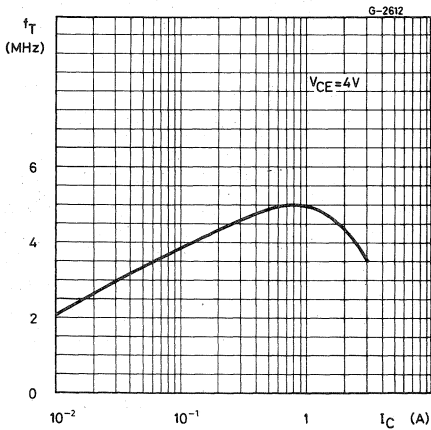
Collector-base capacitance (NPN types)



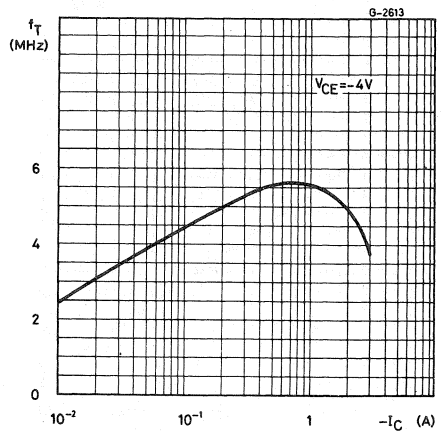
Collector-base capacitance (PNP types)

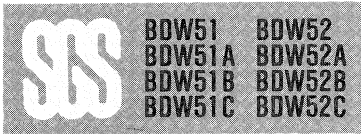


Transition frequency (NPN types)

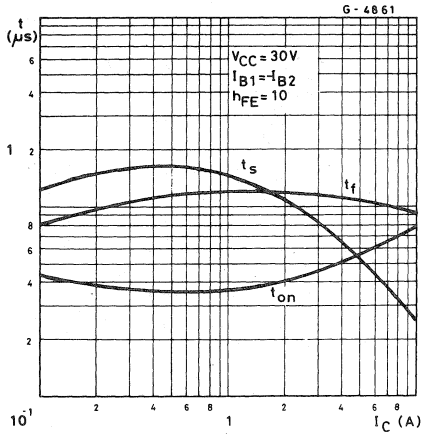


Transition frequency (PNP types)

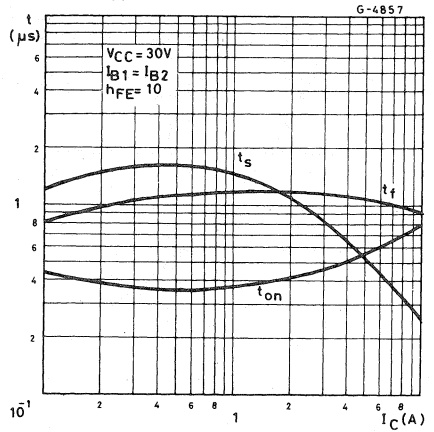




Saturated switching characteristics (NPN types)



Saturated switching characteristics (PNP types)



Power rating chart

