SGS-THOMSON MICROELECTRONICS

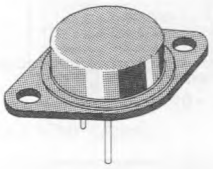
BDW51/A/B/C
BDW52/A/B/C

POWER LINEAR AND SWITCHING APPLICATIONS

DESCRIPTION

The BDW51, BDW51A, BDW51B and BDW51C 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 BDW52, BDW52A, BDW52B and BDW52C respectively.



TO-3

INTERNAL SCHEMATIC DIAGRAMS

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	NPN PNP*	Value				Unit
			BDW51 BDW52	BDW51A BDW52A	BDW51B BDW52B	BDW51C BDW52C	
V_{CBO}	Collector-base 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		15				A
I_{CM}	Collector Peak Current (repetitive)		20				A
I_B	Base Current		7				A
P_{tot}	Total Power Dissipation at $T_{case} \leq 25$ °C		125				W
T_{stg}	Storage Temperature		– 65 to 200				°C
T_j	Junction Temperature		200				°C

For PNP types voltage and current values are negative

THERMAL DATA

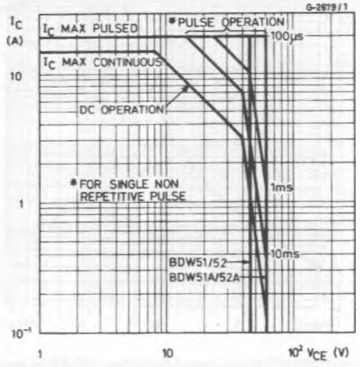
$R_{th\,j\text{-}case}$	Thermal Resistance Junction-case	Max	1.4	°C/W

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

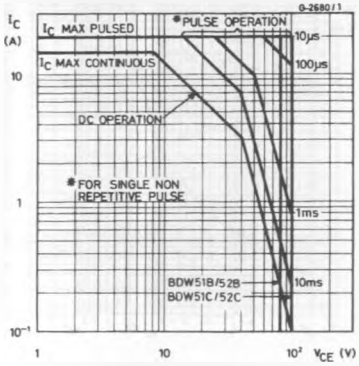
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current (I_E = 0)	for **BDW51/52** V_{CB} = 45 V			500	µA
		for **BDW51A/52A** V_{CB} = 60 V			500	µA
		for **BDW51B/52B** V_{CB} = 80 V			500	µA
		for **BDW51C/52C** V_{CB} = 100 V			500	µA
		T_{case} = 150 °C				
		for **BDW51/52** V_{CB} = 45 V			5	mA
		for **BDW51A/52A** V_{CB} = 60 V			5	mA
		for **BDW51B/52B** V_{CB} = 80 V			5	mA
		for **BDW51C/52C** V_{CB} = 100 V			5	mA
I_{CEO}	Collector Cutoff Current (I_B = 0)	for **BDW51/52** V_{CE} = 22 V			1	mA
		for **BDW51A/52A** V_{CE} = 30 V			1	mA
		for **BDW51B/52B** V_{CE} = 40 V			1	mA
		for **BDW51C/52C** V_{CE} = 50 V			1	mA
I_{EBO}	Emitter Cutoff Current (I_C = 0)	V_{EB} = 5 V			2	mA
$V_{CEO(sus)}$*	Collector-emitter Sustaining Voltage (I_B = 0)	I_C = 100 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 = 5 A I_B = 0.5 A			1	V
		I_C = 10 A I_B = 2.5 A			3	V
$V_{BE(sat)}$*	Base-emitter Saturation Voltage	I_C = 10 A I_B = 2.5 A			2.5	V
V_{BE}*	Base-emitter Voltage	I_C = 5 A V_{CE} = 4 V			1.5	V
h_{FE}*	DC Current Gain	I_C = 5 A V_{CE} = 4 V	20		150	
		I_C = 10 A V_{CE} = 4 V	5			
f_T	Transition Frequency	I_C = 0.5 A V_{CE} = 4 V	3			MHz

* Pulsed : pulse duration = 300 µs, duty cycle = 1.5 %.
For PNP types voltage and current values are negative.

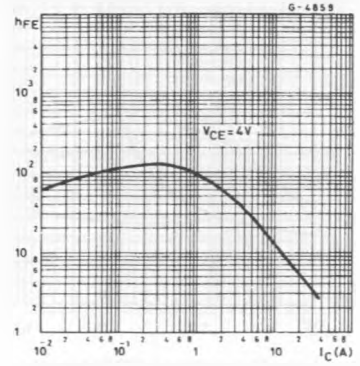
Safe Operating Areas (for **BDW51, BDW51A, BDW52, BDW52A**).



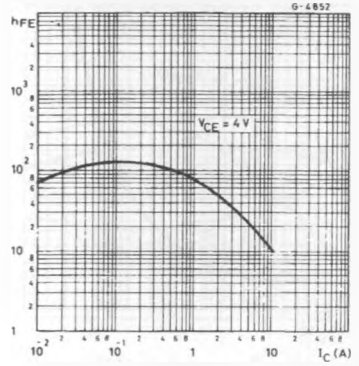
Safe Operating Areas (for **BDW51B, BDW51C, BDW52B, BDW52C**).



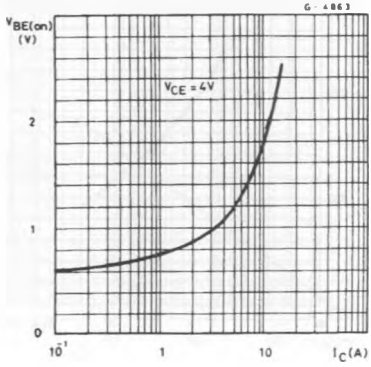
DC Current Gain (NPN types).



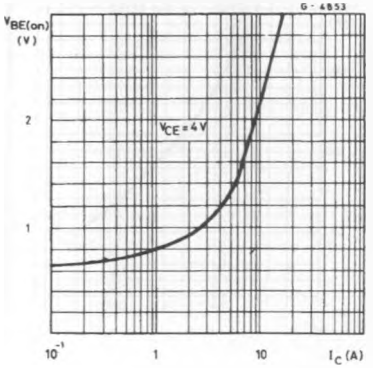
DC Current Gain (PNP types).



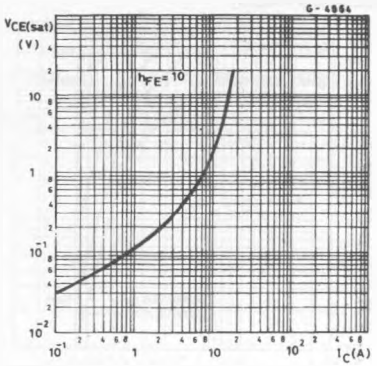
DC Transconductance (NPN types).



DC Transconductance (PNP types).



Collector–emitter Saturation Voltage (NPN types).



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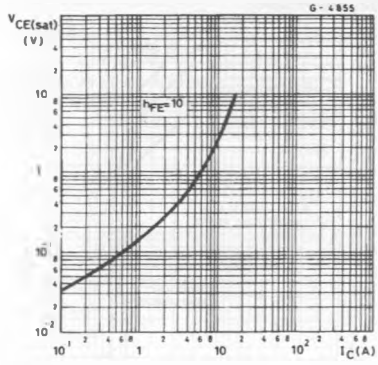
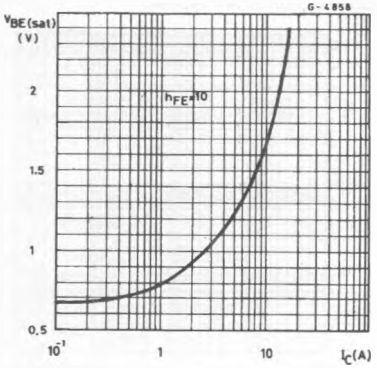
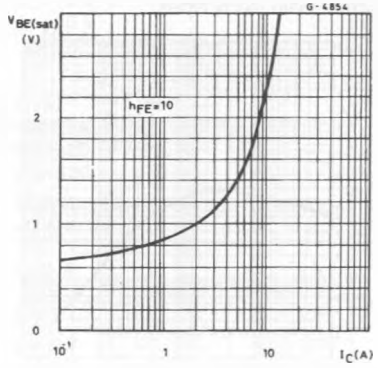


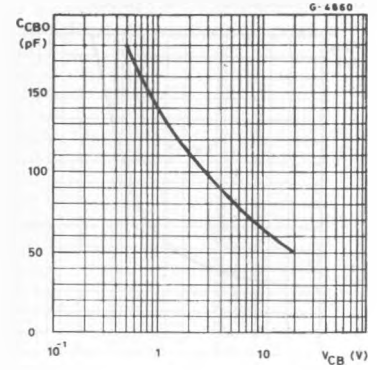
Base–emitter Saturation Voltage (NPN types).



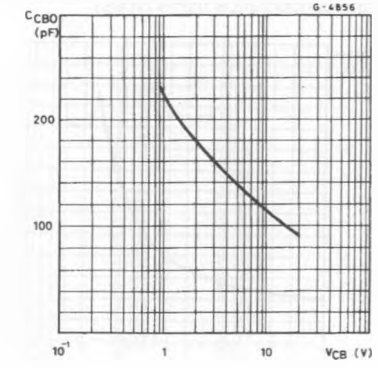
Base –emitter Saturation Voltage (PNP types).



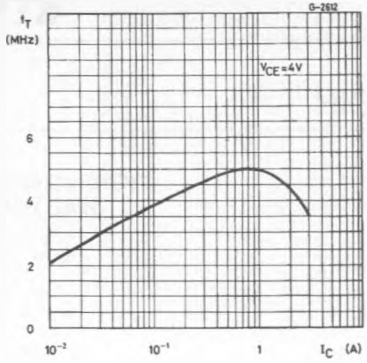
Collector–base Capacitance (NPN types).



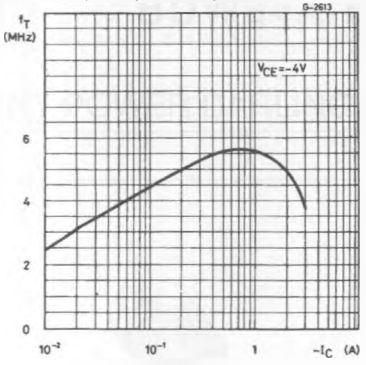
Collector–base Capacitance (PNP types).



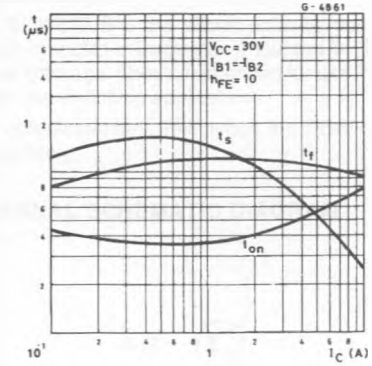
Transition Frequency (NPN types).



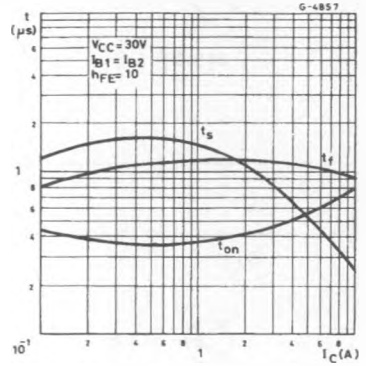
Transition Frequency (PNP types).



Saturated Switching Characteristics (NPN types).



Saturated Switching Characteristics (PNP types).



Power Rating Chart.