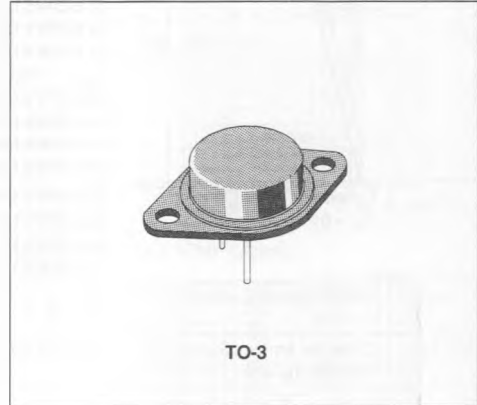


POWER LINEAR AND SWITCHING APPLICATIONS

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.



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 $T_{case} \leq 25^\circ C$		125				W
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

THERMAL DATA

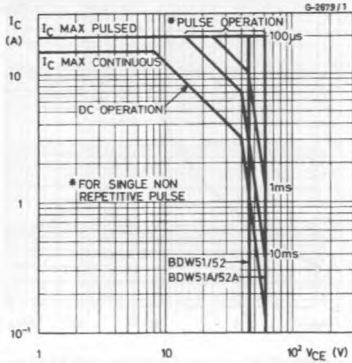
$R_{Th(case)}$	Thermal Resistance Junction-case	Max	1.4	°C/W
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ELECTRICAL CHARACTERISTICS ($T_{case} = 25\text{ °C}$ unless otherwise specified)

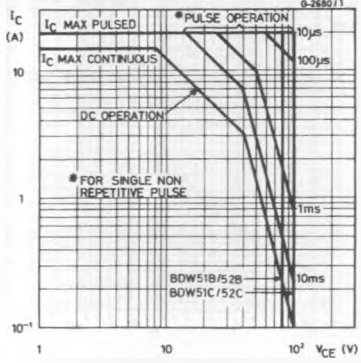
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current ($I_E = 0$)	for BDW51/52 $V_{CB} = 45\text{ V}$			500	μA
		for BDW51A/52A $V_{CB} = 60\text{ V}$			500	μA
		for BDW51B/52B $V_{CB} = 80\text{ V}$			500	μA
		for BDW51C/52C $V_{CB} = 100\text{ V}$			500	μA
		$T_{case}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

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

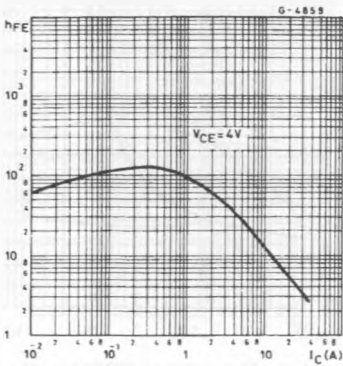
Safe Operating Areas (for **BDW51, BDW51A, BDW52, BDW52A**).



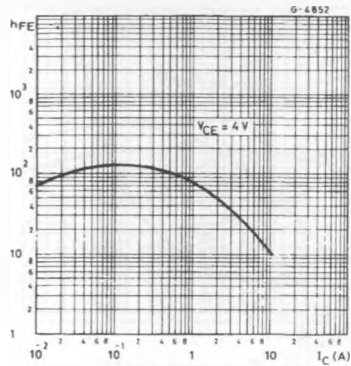
Safe Operating Areas (for **BDW51B, BDW51C, BDW52B, BDW52C**).



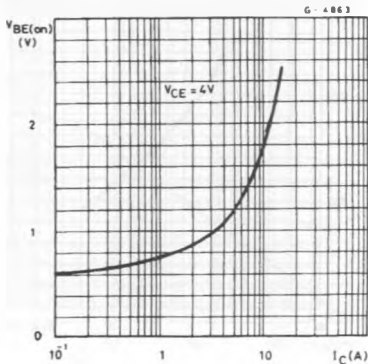
DC Current Gain (NPN types).



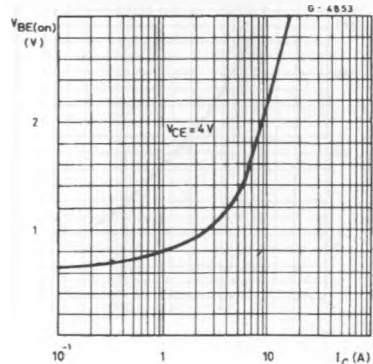
DC Current Gain (PNP types).



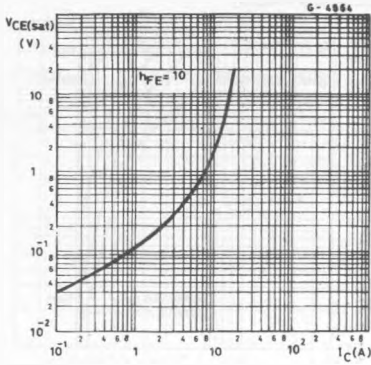
DC Transconductance (NPN types).



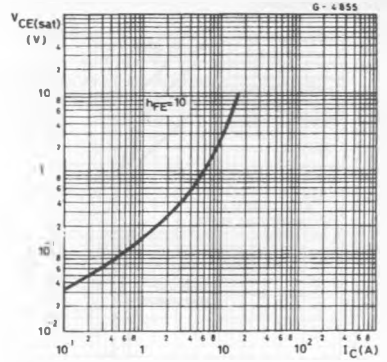
DC Transconductance (PNP types).



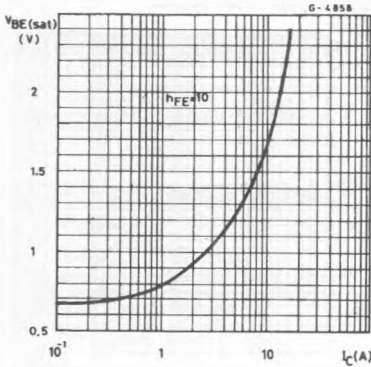
Collector-emitter Saturation Voltage (NPN types).



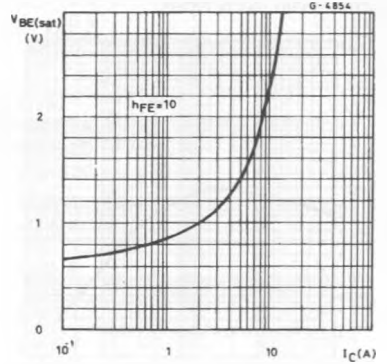
Collector-emitter Saturation Voltage (PNP types).



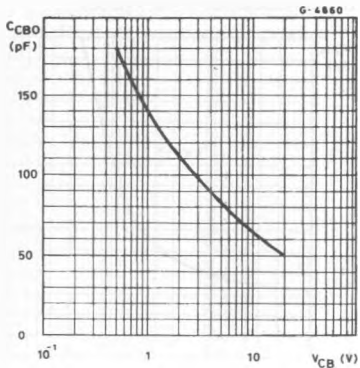
Base-emitter Saturation Voltage (NPN types).



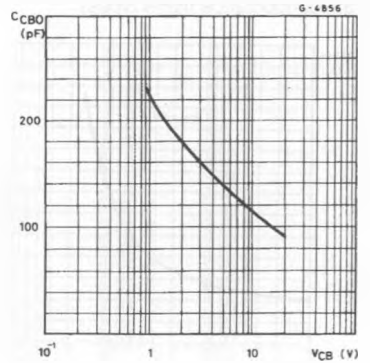
Base-emitter Saturation Voltage (PNP types).



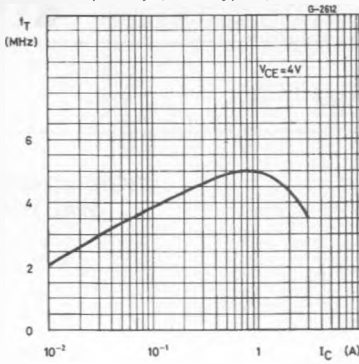
Collector-base Capacitance (NPN types).



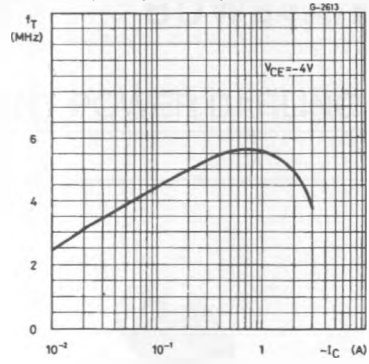
Collector-base Capacitance (PNP types).



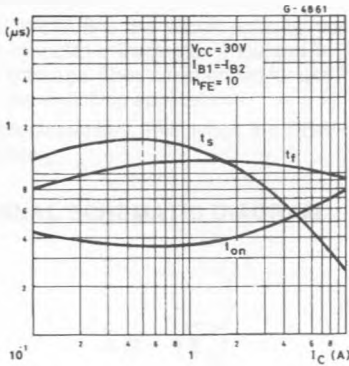
Transition Frequency (NPN types).



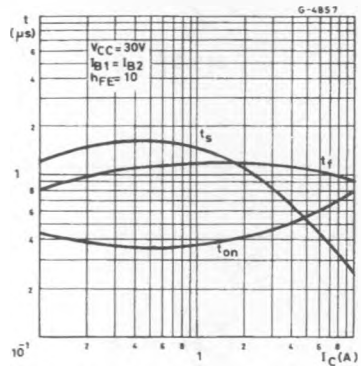
Transition Frequency (PNP types).



Saturated Switching Characteristics (NPN types).



Saturated Switching Characteristics (PNP types).



Power Rating Chart.

