

7294621 POWEREX INC

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 DATA SHEETS

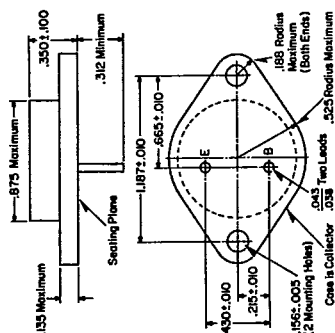
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**Silicon Power Transistors
JEDEC Type 2N3232-3235**

**For Switching, Amplifier and
Regulator Applications
7.5 to 15 Amperes, 115 Watts**

Dimensions in Inches



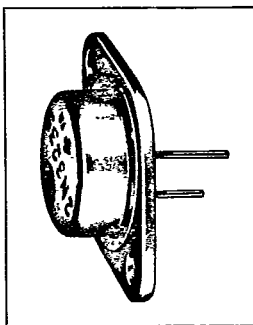
Guarantee

Westinghouse warrants to the original purchaser that it will correct any defects in workmanship, by repair or replacement, f.o.b. factory, for any silicon power semiconductor bearing this symbol Δ ™ during the useful life of the equipment in which it is originally installed. The foregoing said device is used within manufacturer's published ratings and applied in accordance with good engineering practice. The foregoing warranty is exclusive and in lieu of all other warranties of quality whether written, oral, or implied (including any warranty of merchantability or fitness for purpose). Westinghouse shall not be liable for any consequential damages.

Application

These Westinghouse JEDEC devices are PNP diffused transistors. These general-purpose transistors exhibit low saturation voltage, fast switching time, high gain and frequency characteristics. They are particularly useful in industrial and commercial power-switching, amplifier, and regulator applications. The temperature range to 200°C permits reliable operation in high ambient temperatures, and the hermetically sealed TO-3 case insures maximum reliability and long life.

All of these transistors carry the Westinghouse Lifetime Guarantee.



Maximum Ratings

JEDEC Number		2N3232	2N3233	2N3234	2N3235
Maximum Ratings					
Voltage					
*Collector-Emitter, V_{CE} , Volts.....	60	100	160	55	
*Collector-Base, V_{CB} , Volts.....	80	110	160	65	
*Emitter-Base, V_{EB} , Volts.....	6	6	6	7	
Current					
*Collector, I_C , Amps.....	7.5	7.5	7.5	15	
*Base, I_B , Amps.....	3	3	3	7	
Temperature					
*Junction, T_J , °C.....	↔	↔	+200	↔	↔
*Storage, T_{stg} , °C, minimum.....	↔	↔	-65	↔	↔
..... maximum.....	↔	↔	+200	↔	↔
Thermal Characteristics					
*Thermal Resistance, θ_{JC} , °C/Watt, max.....	↔	↔	1.5	↔	↔
*Power Dissipation, P_T at 25°C, Watt, max.....	↔	↔	115	↔	↔

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Electrical Characteristics

 $T_C = 25^\circ\text{C}$ unless otherwise specified

Parameter	Conditions	Symbol	Limits	Units
			Min.	Max.
2N3232 - 2N3234				
*Collector-cutoff current	$V_{CE} = \text{Max. Rating}^\ominus, V_{BE} = -1.5\text{V}$	I_{CEV}	...	1 ma
*Collector-cutoff current	$V_{CE} = \text{Max. Rating}^\ominus, V_{BE} = -1.5\text{V}, T_C = 150^\circ\text{C}$	I_{CEV}	...	5 ma
*Emitter-cutoff current	$V_{EB} = 6\text{V}, I_C = 0$	I_{EBO}	...	1 ma
*Collector-emitter sustaining voltage [Ⓢ]	$I_C = 100\text{ mA}, I_B = 0$	$V_{CEO}(\text{sus})$...	V
*Dc Forward-current transfer ratio [Ⓢ]	$I_C = 3\text{A}, V_{CE} = 10\text{V}$	h_{FE}	18	55
*Collector-emitter saturation voltage	$I_C = 3\text{A}, I_B = 0.2\text{A}$	$V_{CE}(\text{sat})$...	V
*Base-emitter voltage	$I_C = 3\text{A}, V_{CE} = 10\text{V}$	V_{BE}	...	3.5 V
*Small-signal forward current transfer ratio	$I_C = 3\text{A}, V_{CE} = 10\text{V}, f = 1\text{ KHz}$	h_{fe}	10	...
2N3235				
*Collector-cutoff current	$V_{CE} = 90\text{V}, V_{BE} = -1.5\text{V}$	I_{CEV}	...	5 ma
*Collector-cutoff current	$V_{CE} = 45\text{V}, V_{BE} = -1.5\text{V}, T_C = 150^\circ\text{C}$	I_{CEV}	...	5 ma
*Emitter-cutoff current	$V_{EB} = 7\text{V}, I_C = 0$	I_{EBO}	...	5 ma
*Collector-emitter sustaining voltage [Ⓢ]	$I_C = 100\text{ mA}, I_B = 0$	$V_{CEO}(\text{sus})$	55	V
*Dc Forward-current transfer ratio [Ⓢ]	$I_C = 4\text{A}, V_{CE} = 4\text{V}$	h_{FE}	20	70
*Collector-emitter saturation voltage	$I_C = 4\text{A}, I_B = 0.4\text{A}$	$V_{CE}(\text{sat})$...	1.1 V
*Base-emitter voltage	$I_C = 4\text{A}, V_{CE} = 4\text{V}$	V_{BE}	...	1.8 V
*Small-signal forward current transfer ratio	$I_C = 4\text{A}, V_{CE} = 4\text{V}, f = 1\text{ KHz}$	h_{fe}	10	...

* JEDEC registered parameters.

[Ⓢ] Pulse test: duration 300 μs ; duty cycle $\leq 2\%$.[Ⓢ] $V_{CEO}(\text{sus})$ and V_{CE} (max) for 2N3232, 50V; for 2N3233, 100V; for 2N3234, 160V.

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Typical Characteristics, 2N3235

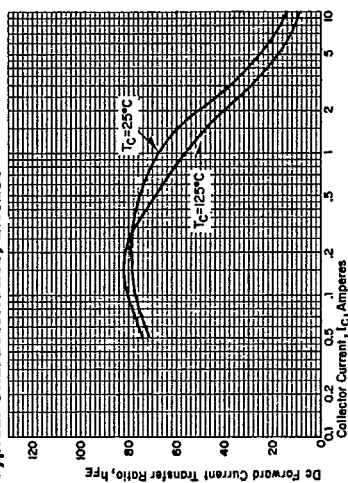


Figure 4. Dc forward current transfer ratio vs. collector current.

Typical Characteristics, 2N3232-2N3234

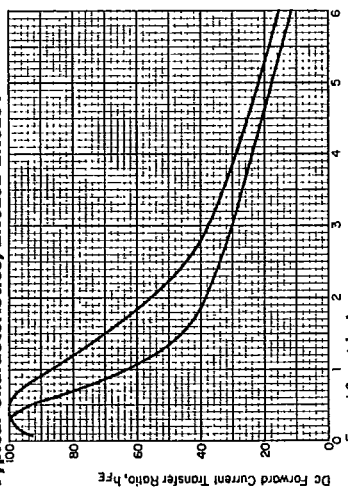


Figure 1. Dc forward current transfer ratio vs. collector current.

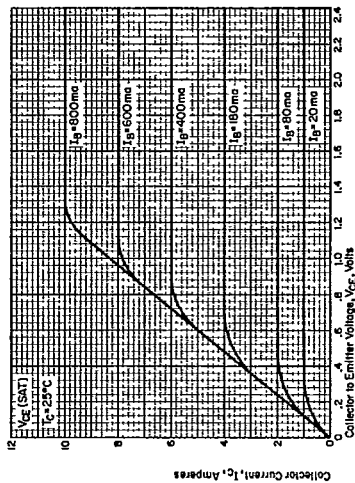


Figure 5. Output characteristics.

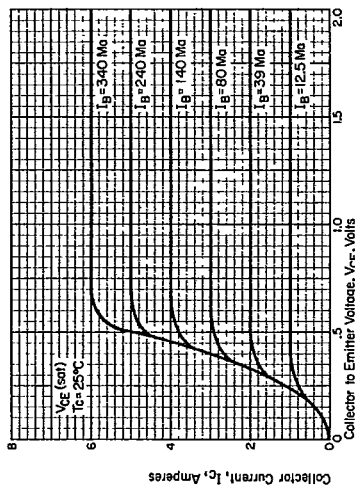


Figure 2. Output characteristics.

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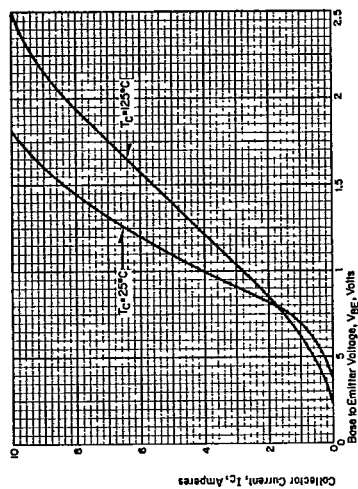


Figure 6. Transconductance characteristics.

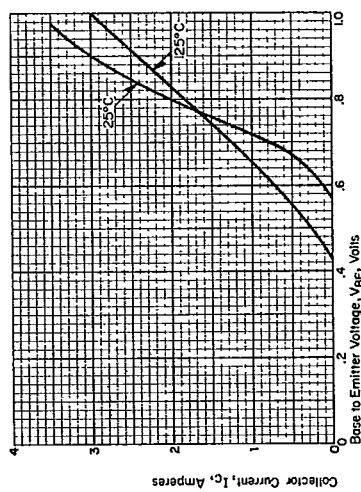


Figure 3. Transconductance characteristics.

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New Information
E, D, C/2116/DB; E, D, C/2117

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