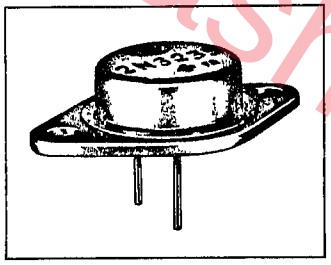
Westinghouse

Silicon Power Transistors
JEDEC Type 2N3232-3235

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



Application

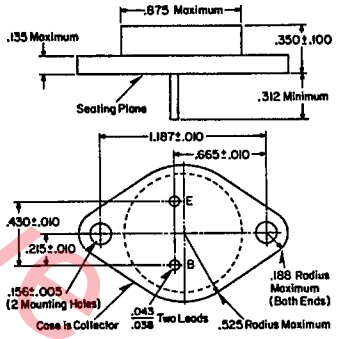
These Westinghouse JEDEC devices are NPN diffused transistors. These general-purpose transistors exhibit low saturation voltage, fast switching time, and high gain and frequency characteristics. They are particularly useful in industrial and commercial power-switching, amplifier, and regulator applications. The temperature range to 200°C permits reliable operation in high ambients, 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✚
Voltage				
*Collector-Emitter, V_{CEO}, Volts	60	100	160	55
*Collector-Base, V_{CBO}, Volts	80	110	160	65
*Emitter-Base, V_{EBO}, 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		→

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 ✚™ during the life of the equipment in which it is originally installed, provided 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.

Electrical Characteristics

T_C=25°C unless otherwise specified

Parameter	Conditions	Symbol	Limits Min.	Limits Max.	Units
2N3232 – 2N3234					
*Collector-cutoff current	V_{CE}=Max. Rating③, V_{BE}=−1.5V	I_{CEV}	...	1	ma
*Collector-cutoff current	V_{CE}=Max. Rating③, V_{BE}=−1.5V, T_C=150°C	I_{CEV}	...	5	ma
*Emitter-cutoff current	V_{EB}=6V, I_C=0	I_{EBO}	...	1	ma
*Collector-emitter sustaining voltage①	I_C=100 mA, I_B=0	V_{CEO}(sus)	③	...	V
*Dc Forward-current transfer ratio①	I_C=3A, V_{CE}=10V	h_{FE}	18	55	..
*Collector-emitter saturation voltage	I_C=3A, I_B=0.2A	V_{CE}(sat)	...	2.5	V
*Base-emitter voltage	I_C=3A, V_{CE}=10V	V_{BE}	...	3.5	V
*Small-signal forward current transfer ratio	I_C=3A, V_{CE}=10V, f=1 KHz	h_{fe}	10	...	..
2N3235					
*Collector-cutoff current	V_{CE}=90V, V_{BE}=−1.5V	I_{CEV}	...	5	ma
*Collector-cutoff current	V_{CE}=45V, V_{BE}=−1.5V, T_C=150°C	I_{CEV}	...	5	ma
*Emitter-cutoff current	V_{EB}=7V, I_C=0	I_{EBO}	...	5	ma
*Collector-emitter sustaining voltage①	I_C=100mA, 1_B=0	V_{CEO}(sus)	55	...	V
*Dc Forward-current transfer ratio①	I_C=4A, V_{CE}=4V	h_{FE}	20	70	..
*Collector-emitter saturation voltage	I_C=4A, I_B=0.4A	V_{CE}(sat)	...	1.1	V
*Base-emitter voltage	I_C=4A, V_{CE}=4V	V_{BE}	...	1.8	V
*Small-signal forward current transfer ratio	I_C=4A, V_{CE}=4V, f=1 KHz	h_{fe}	10	...	..

* JEDEC registered parameters.
① Pulsed; pulse duration 300 μsec; duty cycle ≤ 2%.
③ V_{CEO} (sus) and $V_{CE\ (max)}$ for 2N3232, 60V; for 2N3233, 100V; for 2N3234, 160V.

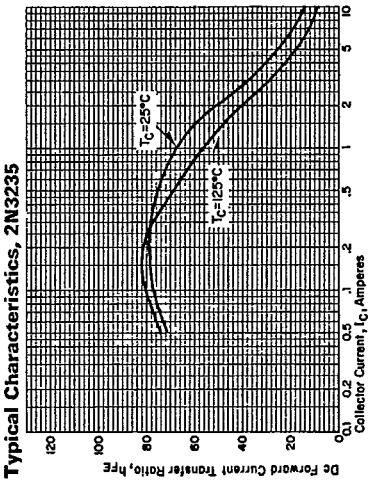


Figure 4. Dc forward current transfer ratio vs. collector current.

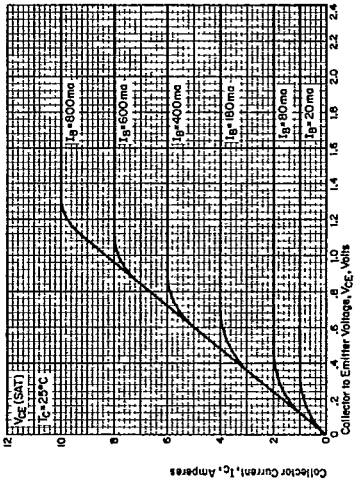


Figure 5. Output characteristics.

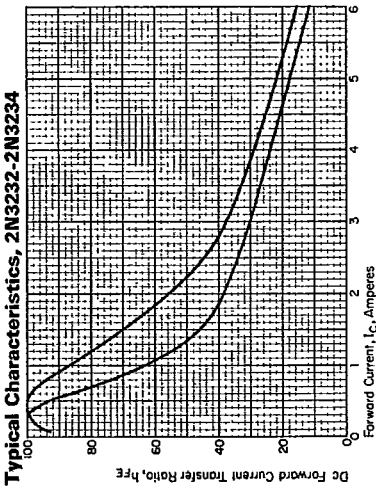


Figure 1. Dc forward current transfer ratio vs. collector current.

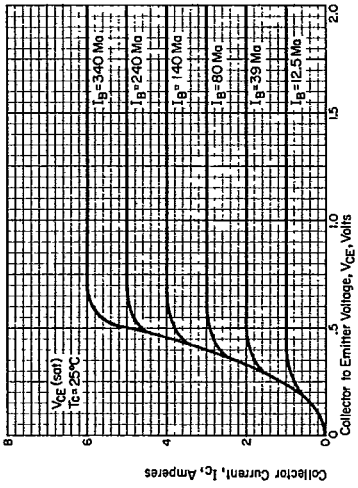


Figure 2. Output characteristics.

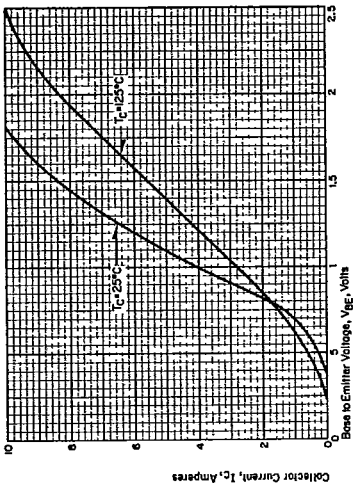


Figure 6. Transconductance characteristics.

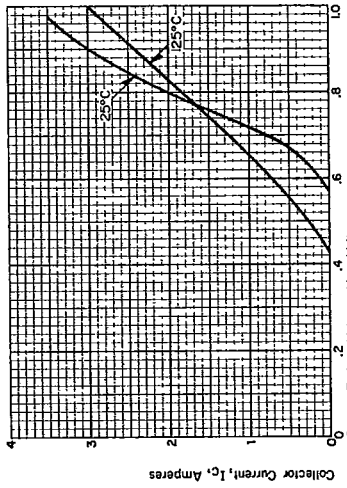


Figure 3. Transconductance characteristics.

February, 1967
New Information
E, D, C/2116/DB; E, D, C/2117

Westinghouse Electric Corporation
Semiconductor Division, Youngwood, Pa. 15697
Printed in USA