

MJ15022, MJ15024

File Number **1293.1**

T-33-15

Silicon N-P-N Epitaxial-Base High-Power Transistors

Rugged Devices, Broadly Applicable For Industrial and Commercial Use

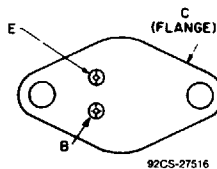
Features:

- High dissipation capability
- Maximum safe-area-of-operation curves
- High voltage
- High gain at high current

Applications:

- High-fidelity amplifiers
- Series and shunt regulators
- Linear/power amplifiers

TERMINAL DESIGNATIONS



JEDEC TO-204AA

The MJ15022 and MJ15024 are ballasted multiple-epitaxial silicon n-p-n transistors featuring high gain at high current and high voltage. They differ from each other in voltage ratings, safe-operating-area (SOA) ratings, and the currents at which the parameters are controlled.

All these types are supplied in the JEDEC TO-204AA steel hermetic package.

POWER TRANSISTORS

MAXIMUM RATINGS, Absolute-Maximum Values:

	MJ15024	MJ15022	
V_{CEO}	400	350	V
$V_{CEB(SUS)} R_{\theta E} = 100 \Omega$	275	225	V
$V_{CBO(SUS)}$	250	200	V
V_{EBO}	_____	5	V
I_C	_____	16	A
I_{CM}	_____	30	A
I_B	_____	5	A
P_T			
At $T_C \leq 25^\circ C$	_____	250	W
At $T_C > 25^\circ C$	_____	1.43	W/ $^\circ C$
Derate linearly			
T_{stg}, T_J	_____	-65 to 200	$^\circ C$
T_L			
At distance $\geq 1/32$ in. (0.8 mm) from seating plane for 10 s max.	_____	230	$^\circ C$

ELECTRICAL CHARACTERISTICS, at Case Temperature (T_C)=25°C

Unless Otherwise Specified

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CHARACTERISTIC	TEST CONDITIONS			LIMITS				UNITS
	VOLTAGE V dc		CURRENT A dc	MJ15024		MJ15022		
	V _{CE}	V _{BE}	I _C	Min.	Max.	Min.	Max.	
I _{CBO}	400 ^a			—	1	—	—	mA
	350 ^a			—	—	—	1	
I _{CEO}	200			—	0.5	—	—	
	150			—	—	—	0.5	
I _{CEX}	400	-1.5		—	0.5	—	0.5	
	250	-1.5		—	0.25	—	—	
	200	-1.5		—	—	—	0.25	
I _{CER} R _{BE} =100 Ω, T _C =150°C	200			—	4	—	—	
	150			—	—	—	4	
h _{FE}	4		3 ^c	—	—	—	—	
	4		5 ^c	—	—	—	—	
	4		8 ^c	15	60	15	60	
	4		16 ^c	5	—	5	—	
V _{CEO(sus)} ^b			0.1	250	—	200	—	V
V _{CER(sus)} ^b R _{BE} =100 Ω			0.1	275	—	225	—	
V _{EBO} I _E =1 mA I _E =0.5 mA				—	—	—	—	
V _{BE}	4		3 ^c	—	—	—	—	
	4		8 ^c	—	2.2	—	2.2	
V _{CE(sat)} I _B =0.3 A I _B =0.8 A I _B =3.2 A			3 ^c	—	—	—	—	
			8 ^c	—	1.4	—	1.4	
			16 ^c	—	4	—	4	
I _S /b t _p =0.5 s nonrep.	80			2	—	2	—	A
	50			5	—	5	—	
h _{fe} f=1 MHz	10		1	4	20	4	20	
f _T	10		1	4	20	4	20	MHz
C _{ob}	10 ^a			—	500	—	500	pF
R _{θJC}	10		10	—	0.7	—	0.7	°C/W

^aV_{CB}.^bCAUTION: Sustaining voltages V_{CER(sus)} and V_{CEO(sus)} MUST NOT be measured on a curve tracer.^cPulsed; pulse duration=300 μs, duty factor=1.8%.

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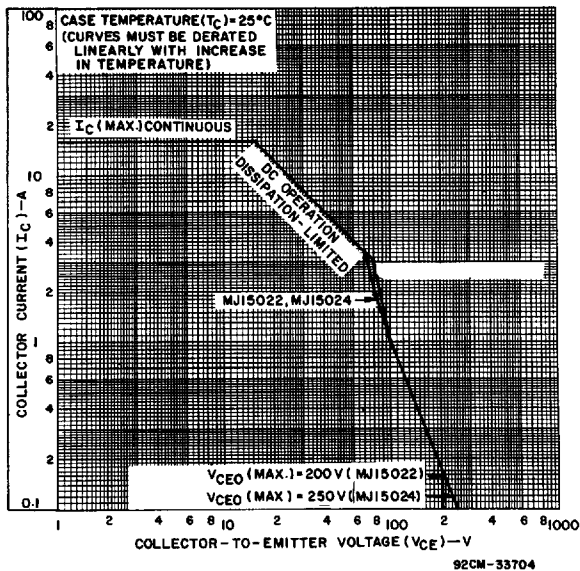


Fig. 1 - Maximum operating areas for all types.

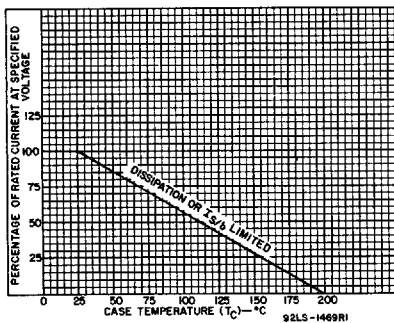


Fig. 2 - Current derating curve for all types.

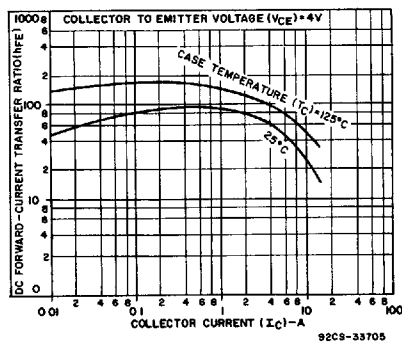


Fig. 3 - Typical dc beta characteristics as a function of collector current for all types.

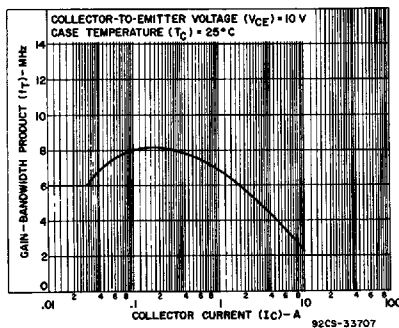


Fig. 4 - Typical gain-bandwidth product for all types.

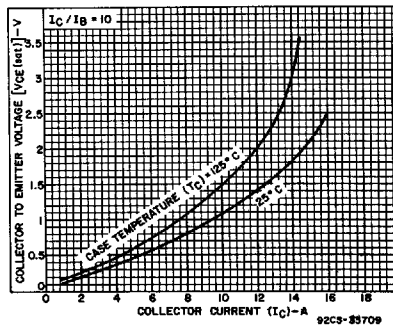


Fig. 5 - Typical saturation voltage characteristics for all types.

POWER TRANSISTORS

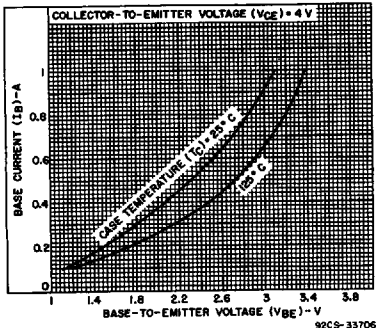


Fig. 6 - Typical input characteristics for all types.

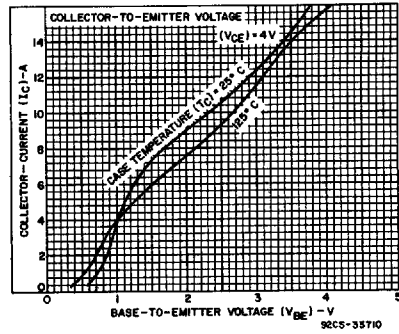


Fig. 7 - Typical transfer characteristics.

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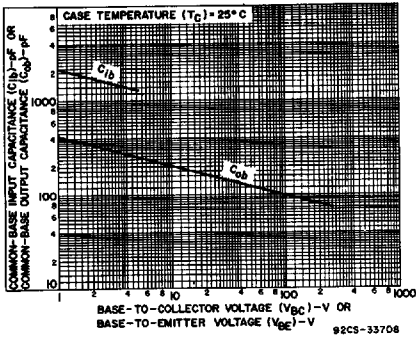
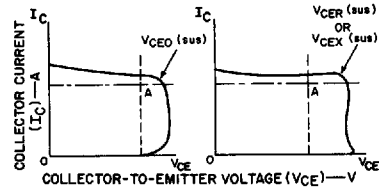


Fig. 8 - Typical common-base input or output capacitance characteristics as a function of reverse voltages for all types.



NOTE: The sustaining Voltages $V_{CE0(sus)}$, $V_{CER(sus)}$ or $V_{CEX(sus)}$ are acceptable when the trace falls to the right and above point "A". (For values of current and voltage, see Electrical Characteristics.)

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Fig. 9 - Oscilloscope display for measurement of sustaining voltages. (Test circuit shown in Fig. 10).

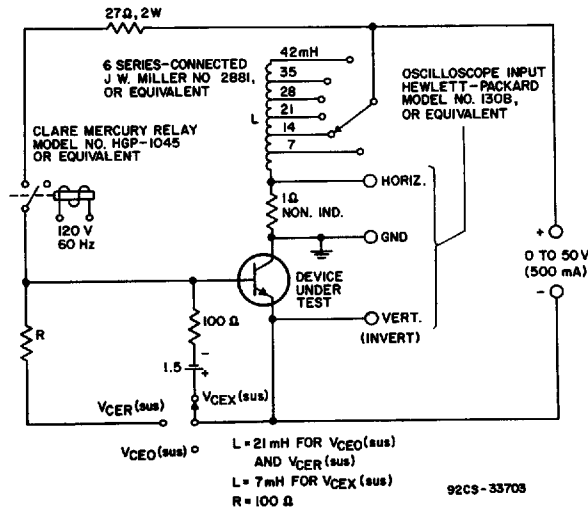


Fig. 10 - Circuit used to measure sustaining voltages $V_{CE0(sus)}$, $V_{CER(sus)}$, and $V_{CEX(sus)}$ for all types.