



**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)**

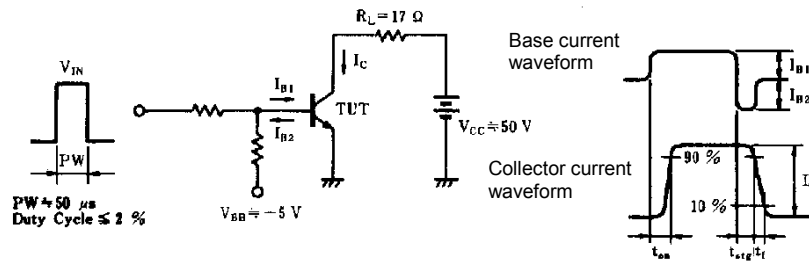
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Collector to Emitter Voltage	V <sub>CEO(SUS)</sub>	I <sub>C</sub> = 3.0 A, I <sub>B</sub> = 0.3 A, L = 1 mH	60			V
Collector to Emitter Voltage	V <sub>CEX(SUS)</sub>	I <sub>C</sub> = 3.0 A, I <sub>B1</sub> = -I <sub>B2</sub> = 0.3 A, V <sub>BE(OFF)</sub> = -1.5 V, L = 180 μH, clamped	60			V
Collector Cut-off Current	I <sub>CBO</sub>	V <sub>CE</sub> = 60 V, I <sub>E</sub> = 0			10	μA
Collector Cut-off Current	I <sub>CER</sub>	V <sub>CE</sub> = 60 V, R <sub>BE</sub> = 51 Ω, T <sub>A</sub> = 125°C			1.0	mA
Collector Cut-off Current	I <sub>CEx1</sub>	V <sub>CE</sub> = 60 V, V <sub>BE(OFF)</sub> = -1.5 V			10	μA
Collector Cut-off Current	I <sub>CEx2</sub>	V <sub>CE</sub> = 60 V, V <sub>BE(OFF)</sub> = -1.5 V, T <sub>A</sub> = 125°C			1.0	mA
Emitter Cut-off Current	I <sub>EBO</sub>	V <sub>EB</sub> = 5.0 V, I <sub>C</sub> = 0			10	μA
DC Current Gain	h <sub>FE1</sub> <sup>Note</sup>	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 0.5 A	100			
DC Current Gain	h <sub>FE2</sub> <sup>Note</sup>	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 1.0 A	100		400	
DC Current Gain	h <sub>FE3</sub> <sup>Note</sup>	V <sub>CE</sub> = 2.0 V, I <sub>C</sub> = 3.0 A	60			
Collector Saturation Voltage	V <sub>CE(sat)1</sub> <sup>Note</sup>	I <sub>C</sub> = 3.0 A, I <sub>B</sub> = 0.15 A			0.3	V
Collector Saturation Voltage	V <sub>CE(sat)2</sub> <sup>Note</sup>	I <sub>C</sub> = 4.0 A, I <sub>B</sub> = 0.2 A			0.5	V
Base Saturation Voltage	V <sub>BE(sat)1</sub> <sup>Note</sup>	I <sub>C</sub> = 3.0 A, I <sub>B</sub> = 0.15 A			1.2	V
Base Saturation Voltage	V <sub>BE(sat)2</sub> <sup>Note</sup>	I <sub>C</sub> = 4.0 A, I <sub>B</sub> = 0.2 A			1.5	V
Collector Capacitance	C <sub>ob</sub>	V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0, f = 1.0 MHz		130		pF
Gain Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> = 10 V, I <sub>E</sub> = -0.5 A		150		MHz
Turn-on Time	t <sub>on</sub>	I <sub>C</sub> = 3.0 A, R <sub>L</sub> = 16.7 Ω, I <sub>B1</sub> = -I <sub>B2</sub> = 0.15 A, V <sub>CC</sub> ≐ 50 V Refer to the test circuit.			0.3	μs
Storage Time	t <sub>stg</sub>				1.5	μs
Fall Time	t <sub>f</sub>				0.3	μs

**Note** Pulse test PW ≤ 350 μs, duty cycle ≤ 2%

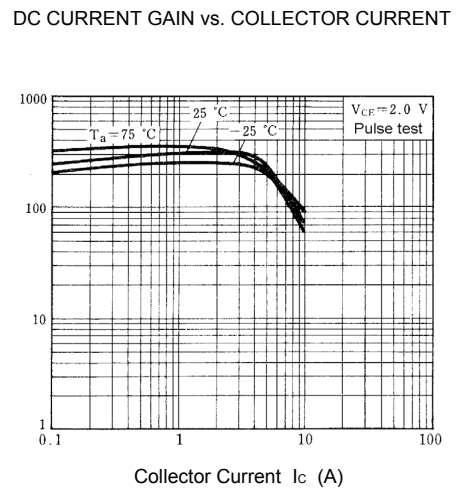
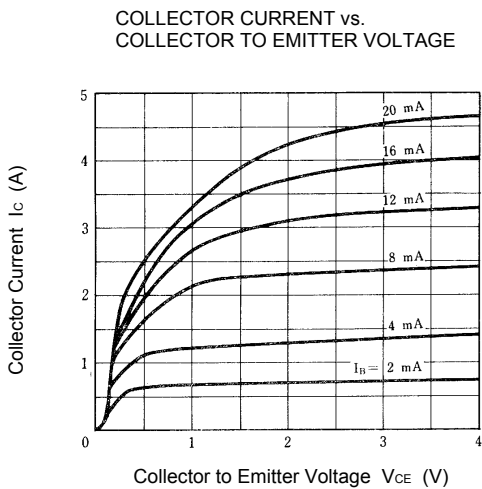
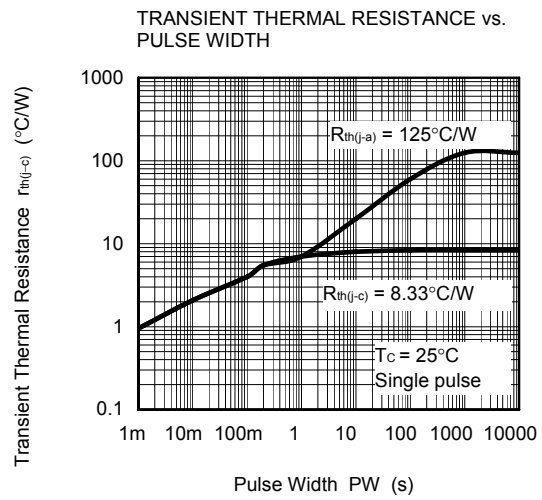
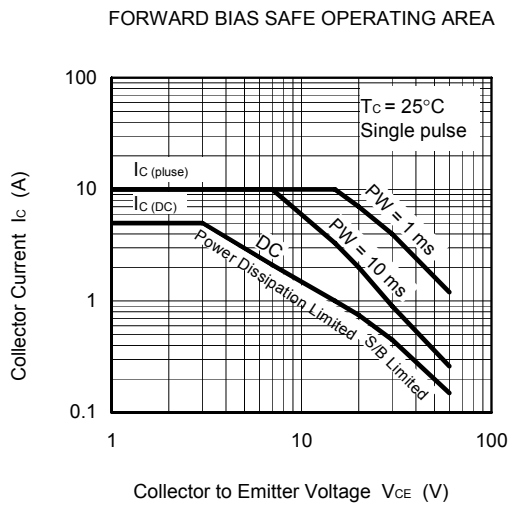
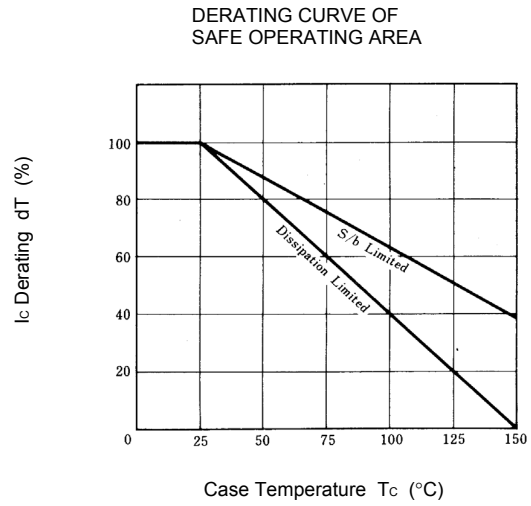
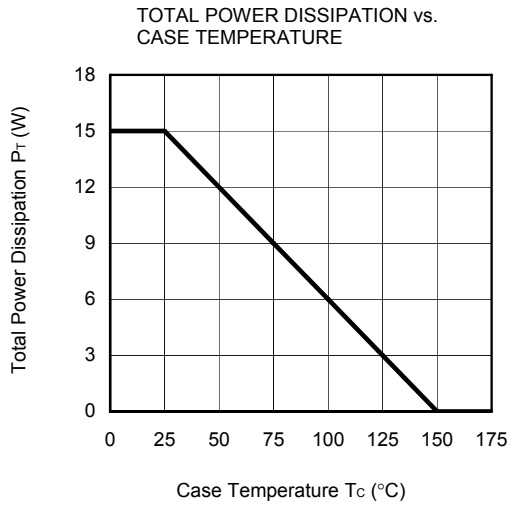
**h<sub>FE</sub> CLASSIFICATION**

Marking	M	L	K
h <sub>FE2</sub>	100 to 200	150 to 300	200 to 400

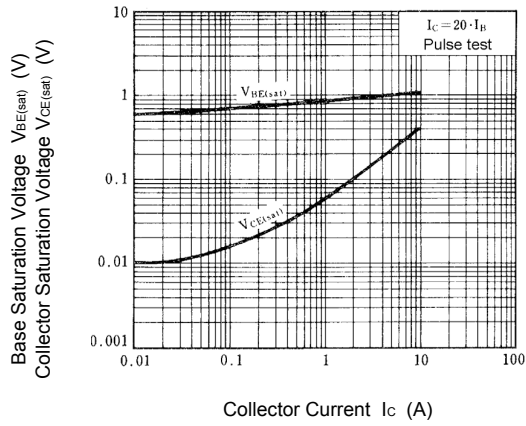
**SWITCHING TIME (t<sub>on</sub>, t<sub>stg</sub>, t<sub>f</sub>) TEST CIRCUIT**



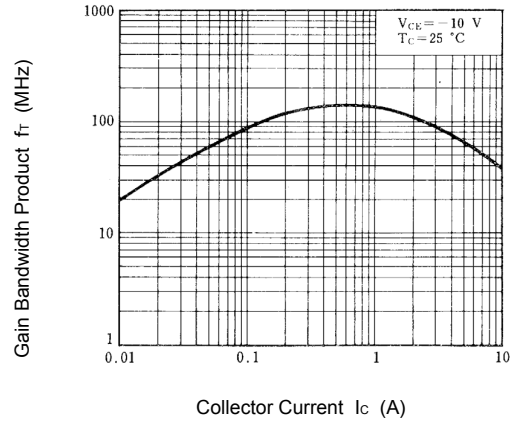
TYPICAL CHARACTERISTICS (T<sub>A</sub> = 25°C)



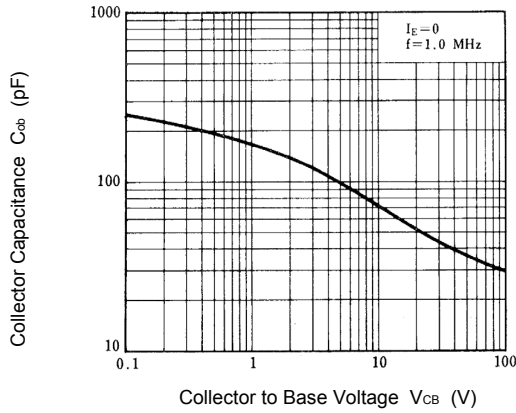
COLLECTOR AND BASE SATURATION VOLTAGE vs. COLLECTOR CURRENT



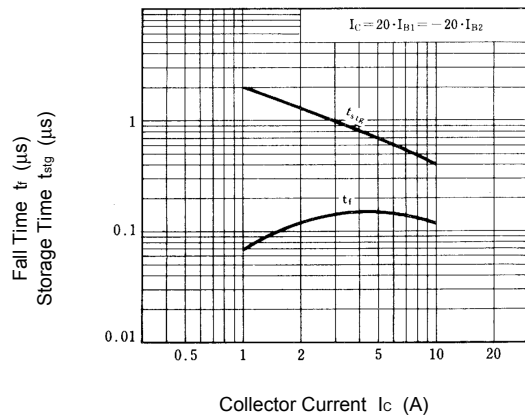
GAIN BANDWIDTH PRODUCT vs. COLLECTOR CURRENT



OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



STORAGE TIME AND FALL TIME vs. COLLECTOR CURRENT



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