POWER TRANSISTORS

30A, 150V, Fast Switching, Silicon NPN Mesa

2N5671
2N5672

FEATURES
- Collector-Base Voltage: up to 150V
- DC Collector Current = 30A
- Low $V_{CE(SAT)}$ = 0.75V Max.
- t_{on} = 0.5μS, t_{fall} = 0.5μS @ I_C = 15A

DESCRIPTION
These glass passivated power transistors combine fast-switching, low saturation voltage and rugged $E_s/_b$ capability. They are designed for use in switching regulators, converters, inverters and switching-control amplifiers.

IV

ABSOLUTE MAXIMUM RATINGS *

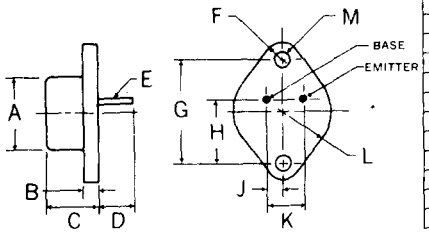
	2N5671	2N5672
* Collector-to-Base Voltage, V_{CBO}	120V	150V
Collector-Emitter Sustaining Voltage, $V_{CEX(SUS)}$	120V	150V
$V_{CER(SUS)}$	110V	140V
$V_{CEO(SUS)}$	90V	120V
* Emitter-Base Voltage, V_{EBO}	7V	7V
* Collector Current, I_C continuous	30A	30A
* Base Current, I_B continuous	10A	10A
* Power Dissipation, 25°C Case	140W	140W
* Operating and Storage Temperature Range	−65 to 200°C	

* JEDEC registered values.

MECHANICAL SPECIFICATIONS

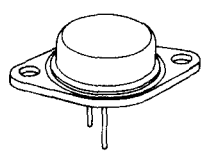
NOTE:
Leads may be soldered to within 1/16" of base provided temperature-time exposure is less than 260°C for 10 seconds.

2N5671 -2N5672



	ins.	mm.
A	.875 MAX.	22.23 MAX.
B	.135 MAX.	3.43 MAX.
C	.250-.450	6.35-11.43
D	.312 MIN.	7.92 MIN.
E	.038-.043 DIA.	0.97-1.09 DIA.
F	.188 MAX. RAD.	4.78 MAX. RAD.
G	1.177-1.197	29.90-30.40
H	.655-.675	16.64-17.15
J	.205-.225	5.21-5.72
K	.420-.440	10.67-11.18
L	.525 MAX. RAD.	13.34 MAX. RAD.
M	.151-.161 DIA.	3.84-4.09 DIA.

TO-3



ELECTRICAL SPECIFICATIONS (at 25°C unless noted)

	Test	Symbol	2N5671 MIN.	2N5671 MAX.	2N5672 MIN.	2N5672 MAX.	Units	Test Conditions
*	D.C. Current Gain (Note 1)	h_{FE}	20	100	20	100		$I_C = 15A, V_{CE} = 2V$
	D.C. Current Gain (Note 1)	h_{FE}	20	—	20	—		$I_C = 20A, V_{CE} = 5V$
*	Collector Saturation Voltage (Note 1)	$V_{CE(sat)}$	—	0.75	—	0.75	V	$I_C = 15A, I_B = 1.2A$
*	Base Saturation Voltage (Note 1)	$V_{BE(sat)}$	—	1.5	—	1.5	V	$I_C = 15A, I_B = 1.2A$
	Base to Emitter Voltage (Note 1)	V_{BE}	—	1.6	—	1.6	V V	$I_C = 15A, V_{CE} = 5V$
*	Collector-Emitter Sustaining Voltage (Note 2)	$V_{CEO(sus)}$	90	—	120	—	V	$I_C = 0.2A, I_B = 0$
*	Collector-Emitter Sustaining Voltage (Note 2)	$V_{CEX(sus)}$	120	—	150	—	V	$I_C = 0.2A$ $V_{BE} = -1.5V$ $I_B = 0$
	Collector-Emitter Sustaining Voltage (Note 2)	$V_{CER(sus)}$	110	—	140	—	V	$R_{BE} = 50\Omega, I_C = 0.2A$
*	Emitter-Cutoff Current	I_{EBO}	10	—	10	—	mA	$V_{EB} = 7.0V$
	Collector Cutoff Current	I_{CEO}	—	10	—	10	mA	$V_{CE} = 80V$
*	Collector Cutoff Current	I_{CEV}	— — —	12 — 15	— — —	— 10 10	mA	$V_{CE} = 110V, V_{BE} = -1.5V$ $V_{CE} = 135V, V_{BE} = -1.5V$ $V_{CE} = 100V, V_{BE} = -1.5V,$ $T_C = 150°C$
	Magnitude of Small Signal Forward — Current Transfer Ratio	h_{fe}	10	—	10	—		$V_{CE} = 10V, I_C = 2A, f = 5MHz$
	Collector Capacitance	C_{ob}	—	900	—	900	pF	$V_{CB} = 10V, f = 1$ MHz
*	Second Breakdown Energy	$E_{s/b}$	20	—	20	—	mJ	$V_{BE} = 4V, I_C = 15A$ $R_{BE} = 20\Omega, L = 180\mu H$
	Forward Bias Second Breakdown Collector Current	$I_{s/b}$	5.8 0.9	— —	5.8 0.9	— —	A	$V_{CE} = 24V, t = 1s$, non-rep. $V_{CE} = 45V, t = 1s$, non-rep.
*	Switching Speeds: Turn-on Time (Delay + Rise)	t_{on}	—	0.5	—	0.5	μS	$I_C = 15A$ $I_{B1} = I_{B2} = 1.2A$ $V_{CC} = 30V$
	Storage Time	t_s	—	1.5	—	1.5	μS	
	Fall Time	t_f	—	0.5	—	0.5	μS	
	Thermal Resistance: Junction-to-Case	$R_{\theta JC}$	—	1.25	—	1.25	°C/W	$V_{CE} = 40V, I_C = 0.5A$

Notes:
1. Pulse width = 250μS; duty cycle ≤1%.
2. Sustaining Voltage. Measured at a high current point where collector-emitter voltage is lowest. Current pulse length ≅ 50μS; duty cycle ≤ 1%. Voltage clamped at maximum collector-emitter voltage.

* JEDEC registered values.

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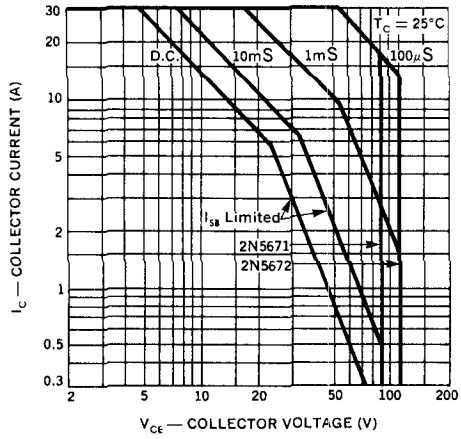
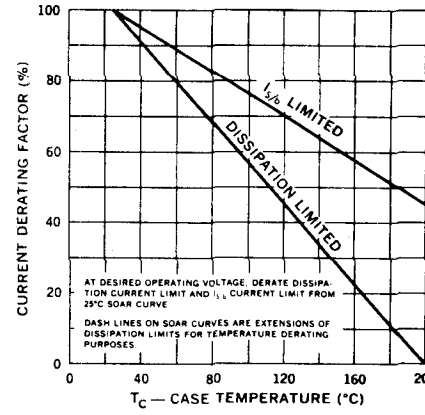
Forward Bias Safe Operating Area

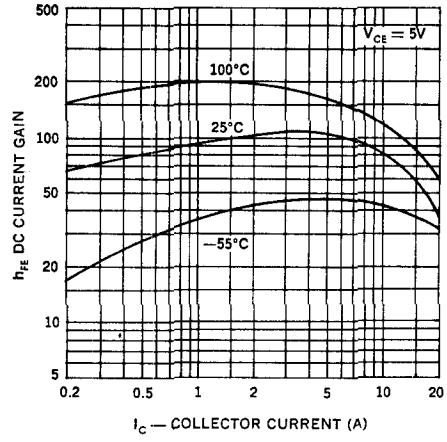


Power Derating

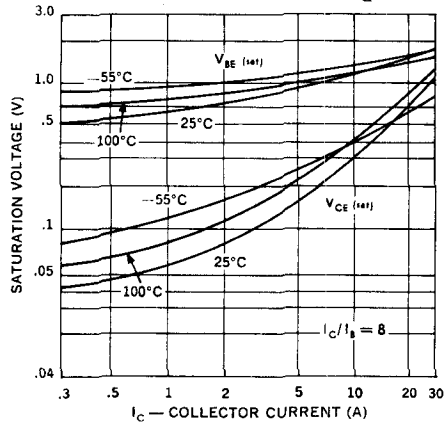


IV

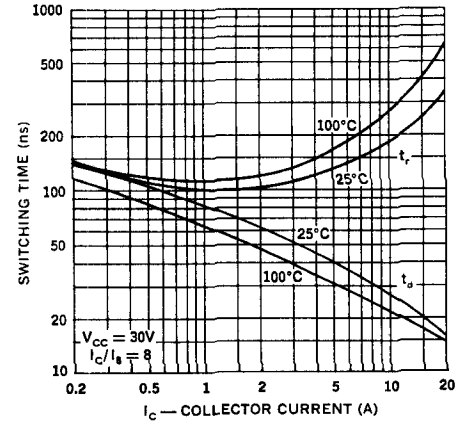
DC Current Gain



Transistor — Saturation Voltages



Resistive — Turn-On Time



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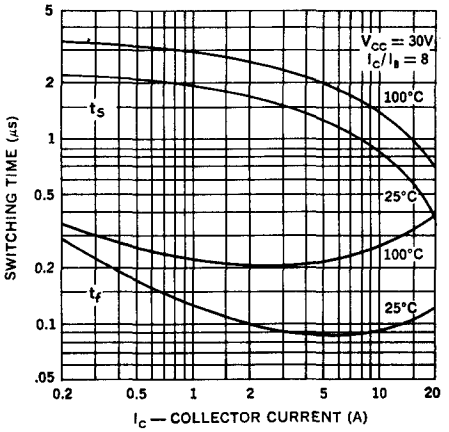
Resistive Turn-Off Time



Switching Time Test Circuit