"BIG IDEAS IN BIG POWER"

PowerTech

150 AMPERES

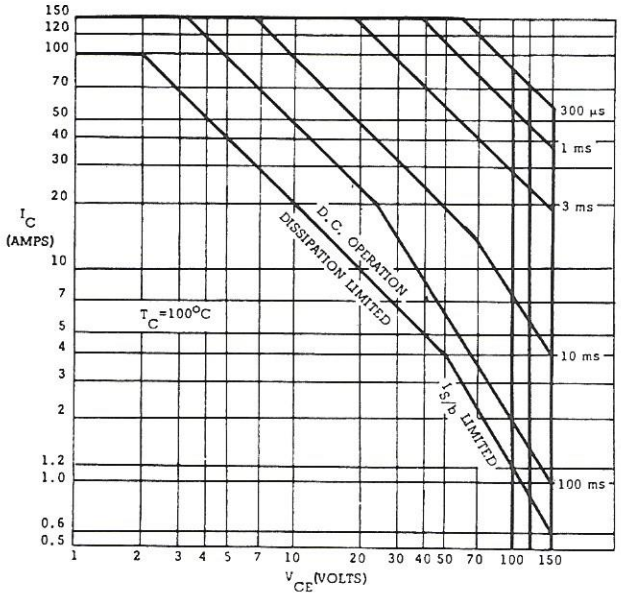
2N5928
PT-8502

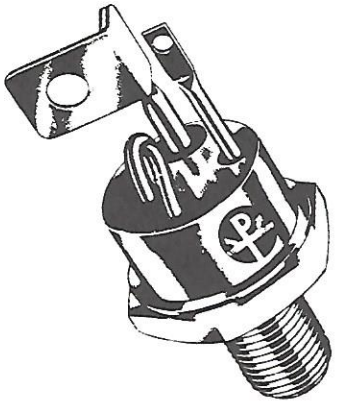
SILICON NPN TRANSISTOR

FEATURES:

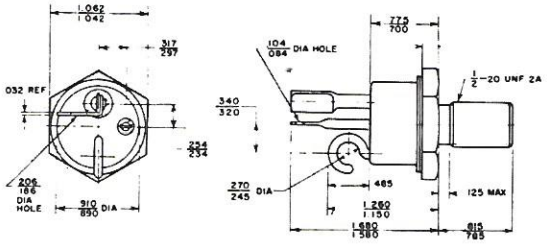
$V_{CE(sat)}$	1.0 V @ 100 A	h_{FE}	5 min @ 150 A	$I_{S/b}$	1.2 A @ 100 V
V_{BE}	2.0 V @ 100 A	t_f	2.5 μ sec	$E_{S/b}$	6 Joules

SAFE OPERATING AREA





JEDEC TO-114 PKG.



PowerTech's transistors offer high current capability, high breakdown voltage and the lowest available saturation voltage. They have exceptional resistance to both forward and reverse second breakdown. This unique combination of device characteristics makes them particularly suited for a wide variety of high current applications, which include series and switching regulators, motor controls, servoamplifiers and power control circuits. The transistors will provide outstanding performance when used as replacements for paralleled lower current devices, resulting in considerable reductions in weight, space and circuit complexity. Their reliability is assured through 100% power testing at 50V, 4A @ 100°C case temperature. These transistors exceed the requirements of MIL-S-19500 and are well suited for the most severe military-aerospace applications.

MAXIMUM RATINGS	SYMBOL	PT-8502	2N5928
Collector-Base Voltage	V_{CBO}	100V	120V
Collector-Emitter Voltage	V_{CEO} (sus)	100V	120V
Emitter-Base Voltage	V_{EBO}	10V	10V
Peak Collector Current	I_C	150A	150A
D.C. Collector Current	I_C	100A	100A
Power Dissipation @ 25°C	P_D	350W	350W
Power Dissipation @ 100°C	P_D	200W	200W
Thermal Resistance	θ_{J-C}	0.5° C/W	0.5°C/W
Operating Temperature Range		-65 to 200°C	-65 to 200°C
Storage Temperature Range		-65 to 200°C	-65 to 200°C

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ELECTRICAL CHARACTERISTICS 25°C

TEST	SYMBOL	LIMITS				UNITS	TEST CONDITIONS
		PT8502		2N5928			
		MIN.	MAX.	MIN.	MAX.		
D.C. Current Gain*	h_{FE}	10	40	10	40	–	I_C = 100A, V_{CE} = 2V
D.C. Current Gain*	h_{FE}	5	–	5	–	–	I_C = 150A, V_{CE} = 4V
Collector Saturation Voltg.*	$V_{CE\ (sat)}$	–	1.0	–	1.0	V	I_C = 100A, I_B = 10A
Collector Saturation Voltg.*	$V_{CE\ (sat)}$	–	2.0	–	2.0	V	I_C = 150A, I_B = 25A
Base Emitter Voltage*	V_{BE}	–	2.0	–	2.0	V	I_C = 100A, V_{CE} = 2V
Base Emitter Voltage*	V_{BE}	–	3.0	–	3.0	V	I_C = 150A, V_{CE} 4V
Collector-Emitter Voltage*	$V_{CEO\ (sus)}$	100	–	120	–	V	I_C = 200mA, I_B = 0
Collector Cutoff Current	I_{CBO}	–	2	–	–	mA	V_{CB} = 100V, I_{EB} = 0
Collector Cutoff Current	I_{CBO}	–	–	–	2	mA	V_{CB} = 120V, I_{EB} = 0
Collector Cutoff Current @ 150° C	I_{CBO}	–	10	–	10	mA	V_{CB} = 100V, I_{EB} = 0
Emitter Cutoff Current	I_{EBO}	–	1	–	1	mA	V_{EB} = 10V, I_{CB} = 0
Gain Bandwidth Product (Typ.)	f_t	1	–	1	–	MHz	I_C = 5A, V_{CE} = 10V, f=100KHz
Collector Capacitance	C_{obo}	–	1800	–	1800	pf.	V_{CB} = 10V, f = 100KHz
Switching Speed (Typ.) (PowerTech Test Circuit)	t_r	–	2.5	–	2.5	μ sec	I_C = 50A
	t_s	–	3	–	3	μ sec	
	t_f	–	2.5	–	2.5	μ sec	I_{B1} = 10A, – I_{B2} = 5A

*$\leq$ 300 μ sec Pulse 2% Duty Cycle

Fig. 1 h_{FE} vs I_C

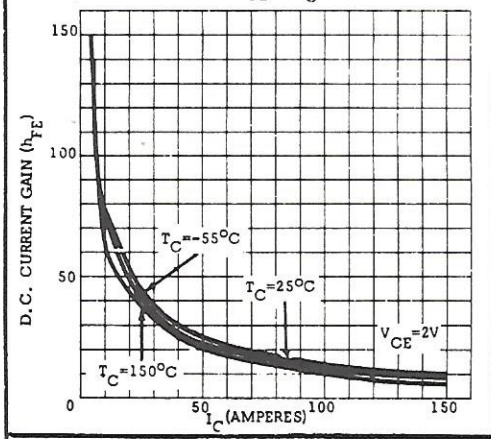


Fig. 2 $V_{CE(sat)}$ vs I_C

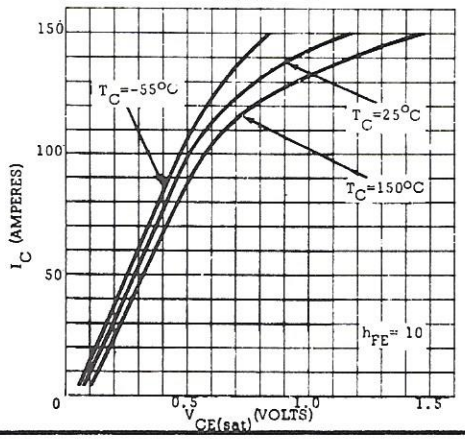


Fig. 3 V_{BE} vs I_C

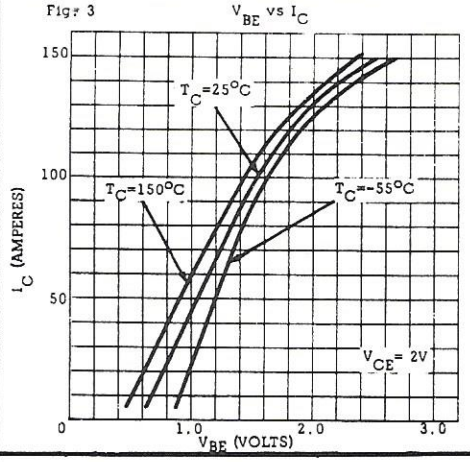


Fig. 4 POWER DISSIPATION vs TEMPERATURE

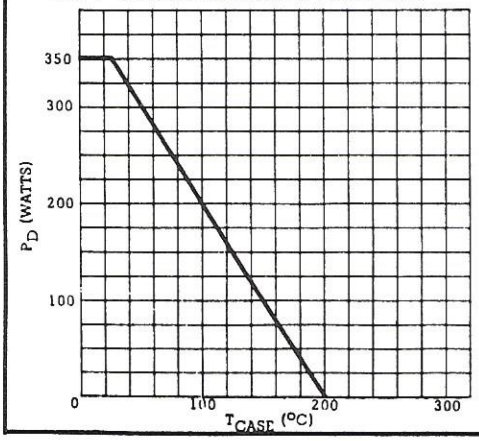
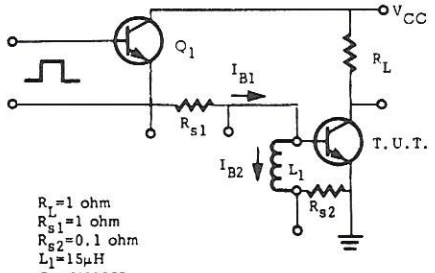
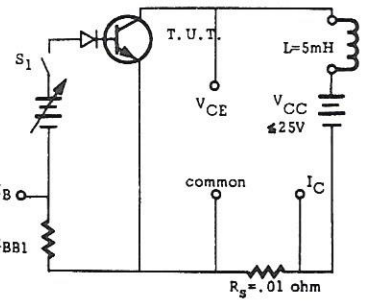


Fig. 5 SWITCHING TEST CIRCUIT



R_L=1 ohm
R_{s1}=1 ohm
R_{s2}=0.1 ohm
L_1=15μH
Q_1=2N5552

Fig. 6 UNCLAMPED INDUCTIVE SWEEP TEST



PROCEDURE
With S_1 closed, set I_B=8A, I_C=50A
Open S_1
$E_{S/b}$=1/2LI²=6.25 Joules