BIG POWER"

PowerTech

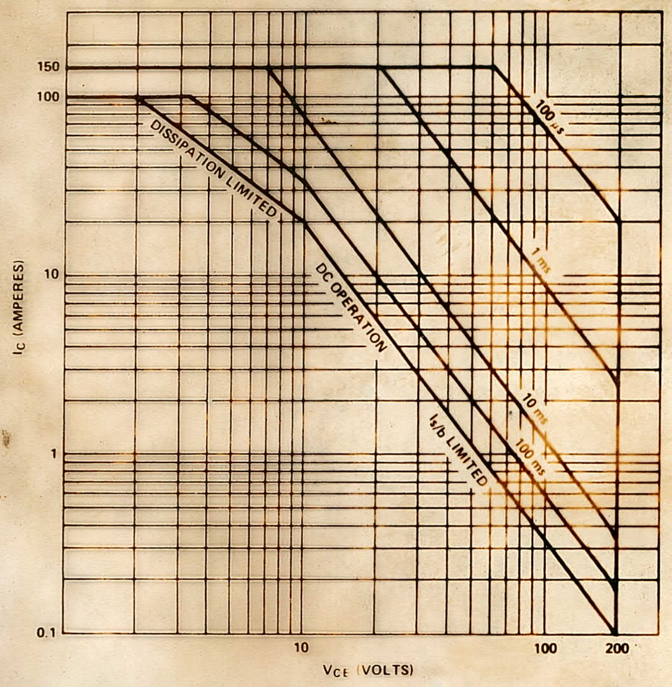
150 AMPERES

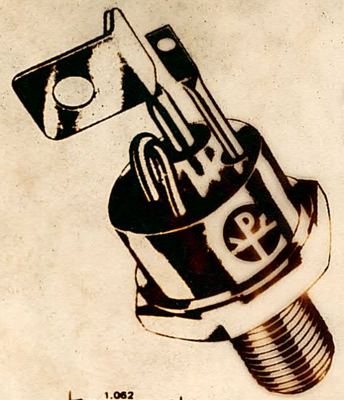
PT-4500

HIGH VOLTAGE SILICON NPN TRANSISTOR

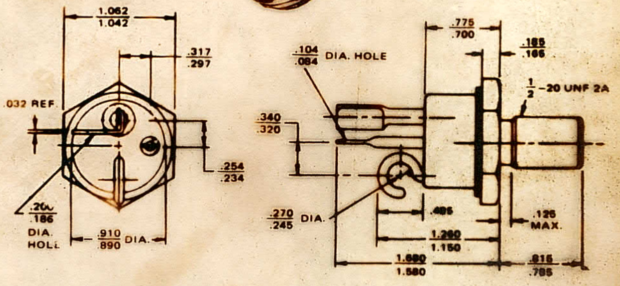
FEATURES

$V_{CE(sat)}$	0.75 @ 100A	h_{FE}	10 @ 100A	$I_{S/B}$	0.1A @ 200V
V_{BE}	1.5 @ 100A	t_f	0.5 µsec.	$E_{S/b}$	1.5 Joules





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 30V, 3.3A @ 100°C case temperature. These transistors exceed the requirements of MIL-S-19500 and are well suited for the most severe military-aerospace applications.

ABSOLUTE MAXIMUM RATINGS	SYMBOL	TYPE #PT-4500
Collector-Base Voltage	V_{CBO}	300V
Collector-Emitter Voltage	V_{CEO}	200V
Emitter-Base Voltage	V_{EBO}	10V
Peak Collector Current	I_{CM}*	150A
D. C. Collector Current	I_C	100A
Power Dissipation at 25°C Case Temperature	P_D	350W
Power Dissipation at 100°C Case Temperature	P_D	200W
Operating Junction Temperature Range	T_J	−65° to 200°C
Storage Temperature Range	T_A	−65° to 200°C
Package:		TO-114
Thermal Resistance	θ_{JC}	0.5°C

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ELECTRICAL SPECIFICATIONS (at 25°C unless otherwise noted)

TEST	SYMBOL	MIN.	MAX.	UNITS	TEST CONDITIONS
D. C. Current Gain*	h_{FE}	20	60		I_C=50A, V_{CE}=3V
D. C. Current Gain*	h_{FE}	10			I_C=100A, V_{CE}=3V
Collector Saturation Voltage*	$V_{CE(sat)}$		0.4	V	I_C=50A, I_B=5A
Collector Saturation Voltage*	$V_{CE(sat)}$		0.75	V	I_C=100A, I_B=10A
Base Emitter Voltage*	V_{BE}		1.0	V	I_C=50A, V_{CE}=5V
Base Emitter Voltage*	V_{BE}		1.5	V	I_C=100A, V_{CE}=5V
Collector-Emitter Breakdown Voltage*	$V_{CEO(sus)}$	200		V	I_C=100mA, I_B=0
Collector Cutoff Current	I_{CBO}		2	mA	V_{CB}=300V, I_{EB}=0
Collector Cutoff Current @ 150°C	I_{CBO}		20	mA	V_{CB}=100V, I_{EB}=0
Emitter Cutoff Current	I_{EBO}		5	mA	V_{EB}=10V, I_{CB}=0
Gain Bandwidth Product	f_t	10		MHz	I_C=5A, V_{CE}=10V
Collector Capacitance	C_{obo}		400	pF	V_{CB}=10V, f=1MHz
Switching Speed (typical)	t_r		0.5	μsec	I_C=50A
	t_s		1.2	μsec	I_{B1} = I_{B2} = 5A
	t_f		0.5	μsec	

*PW ≤ 300 μsec, D. C. ≤ 2%

φ V_{CE} measured with pulse 300 μsec maximum, I_B = 100μA

Do Not Use Curve Tracer

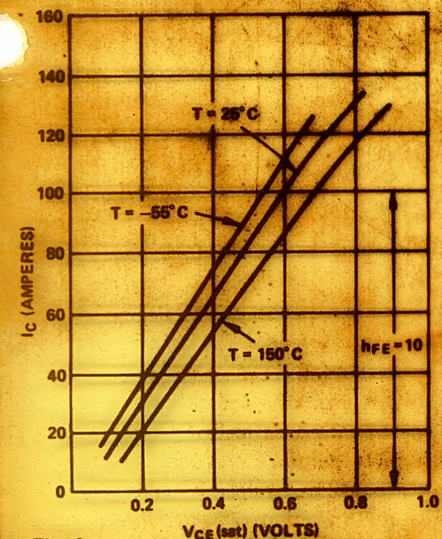


Fig. 1

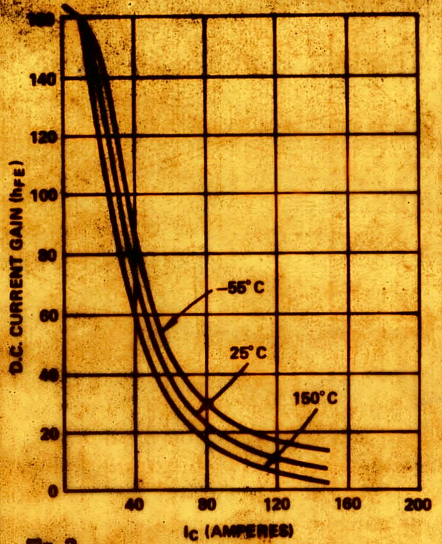


Fig. 2

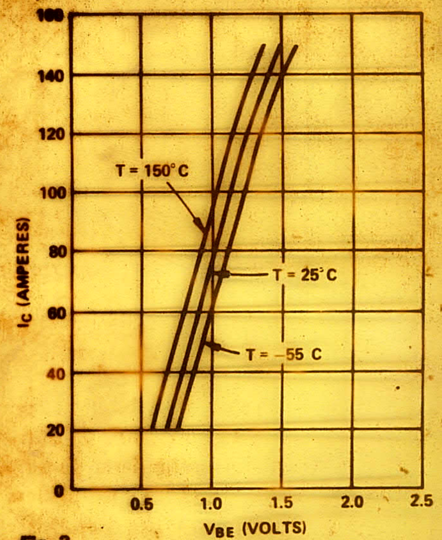


Fig. 3

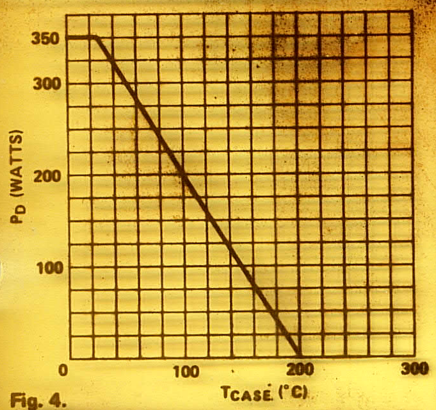


Fig. 4.
POWER DISSIPATION vs TEMPERATURE

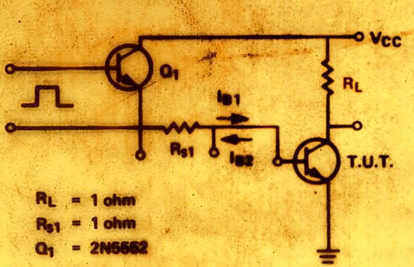
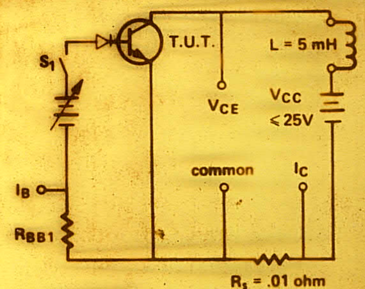


Fig. 5. SWITCHING TEST CIRCUIT



PROCEDURE

With S_1 closed, set I_B = 8A, I_C = 50A

Open S_1

$E_{S/b}$ = 1 1/2LI² = 1.5 Joules

Fig. 6.
UNCLAMPED INDUCTIVE SWEEP TEST