

POWERTECH INC

"BIG IDEAS IN
BIG POWER"

PowerTech

70 AMPERES

T-33-15

PT-3512

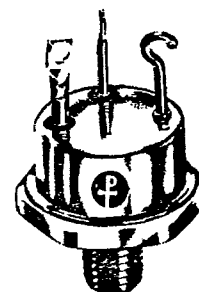
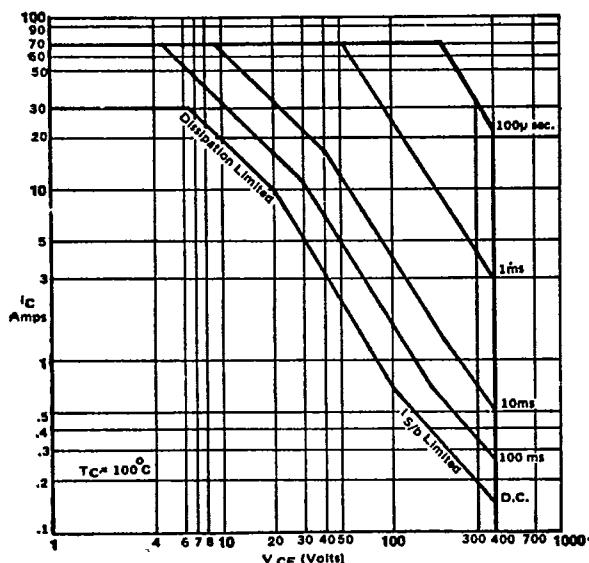
PT-3513

HIGH VOLTAGE SILICON NPN TRANSISTOR

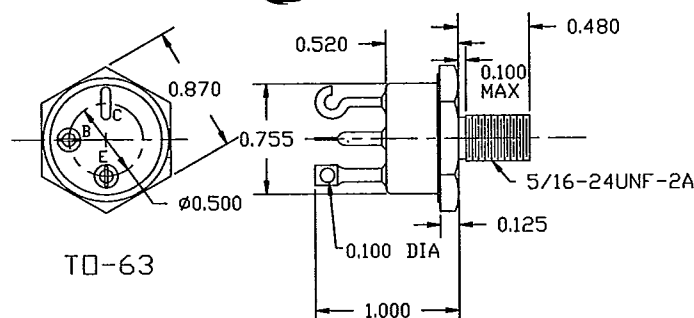
FEATURES

 $V_{CE(sat)}$ 0.5V @ 30A h_{FE} 5 min. @ 70A $I_{S/b}$ 15A @ 400V V_{BE} 1.2V @ 30A t_f 0.5 μ sec. $E_{S/b}$ 2.5 Joules

SAFE OPERATING AREA



JEDEC TO-63



TO-63

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, 2A @ 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

TYPE PT-3512

PT-3513

Collector-Base Voltage, V_{CBO}

400V

450V

Collector-Emitter Voltage, V_{CEO}

325V

400V

Emitter-Base Voltage, V_{EBO}

10V

Peak Collector Current, I_{CM}^*

70A

D.C. Collector Current, I_C

30A

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-63

Thermal Resistance θ_{JC}

.5° C/W

T-33-15

TEST	SYMBOL	PT-3512		PT-3513		UNIT	TEST CONDITIONS
		MIN.	MAX.	MIN.	MAX.		
D.C. Current Gain*	h_{FE}	10	50	10	50	—	$I_C=30A, V_{CE}=5V$
D.C. Current Gain*	h_{FE}	5	—	5	—	—	$I_C=70A, V_{CE}=5V$
Collector Saturation Voltage*	$V_{CE(sat)}$	—	0.6	—	0.6	V	$I_C=30A, I_B=4A$
Base Emitter Voltage*	V_{BE}	—	1.5	—	1.5	V	$I_C=30A, V_{CE}=5V$
Col. -Em. Breakdown Voltage* $\emptyset$	$V_{CEO(sus)}$	325	—	—	—	V	$I_C=50mA, I_B=0$
Col. -Em. Breakdown Voltage* $\emptyset$	$V_{CEO(sus)}$	—	—	400	—	V	$I_C=50mA, I_B=0$
Collector Cutoff Current	I_{CBO}	—	2	—	—	mA	$V_{CB}=400V, I_{EB}=0$
Collector Cutoff Current	I_{CBO}	—	—	—	2	mA	$V_{CB}=450V, I_{EB}=0$
Col. Cutoff Current @ 150°C	I_{CBO}	—	20	—	—	mA	$V_{CB}=250V, I_{EB}=0$
Emitter Cutoff Current	I_{EBO}	—	5	—	5	mA	$V_{EB}=10V, I_{CB}=0$
Gain Bandwidth Product (Typ.)	f_t	10	—	10	—	MHz	$I_C=5A, V_{CE}=10V$
Collector Capacitance	C_{obo}	—	400	—	400	pf.	$V_{CB}=150V$
Switching Speed (Typ.)	t_r	—	.5	—	.5	μs	$I_C=30A, V_{CC}=150V$
	t_s	—	1.2	—	1.2	μs	$I_{B1}=-I_{B2}=3A$
	t_f	—	.5	—	.5	μs	

* $P_W \leq 300 \mu s$, D.C. $\leq 2\%$

$\emptyset V_{CE}$ measured with pulse 300 μs max., $I_B=100\mu A$

Do Not Use Curve Tracer

Fig. 1 $V_{CE(sat)}$ vs I_C

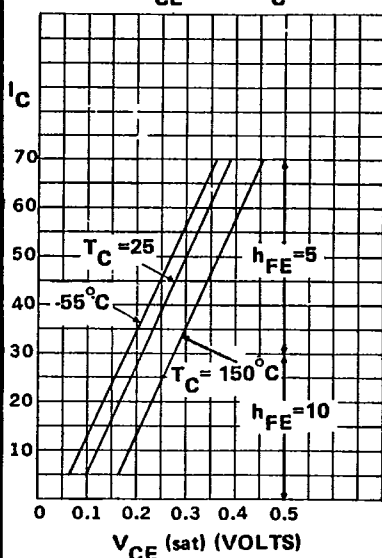


Fig. 2 h_{FE} vs I_C

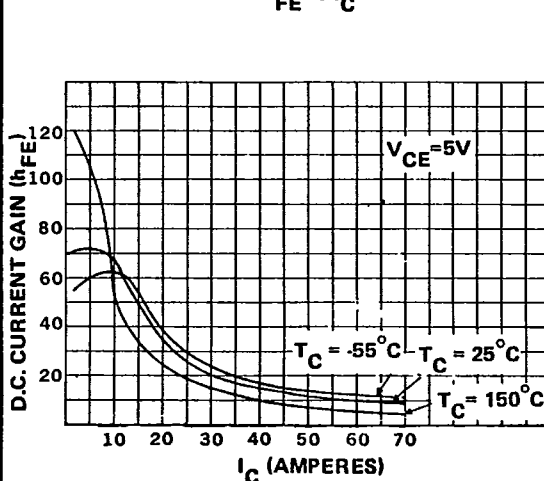


Fig. 3 V_{BE} vs I_C

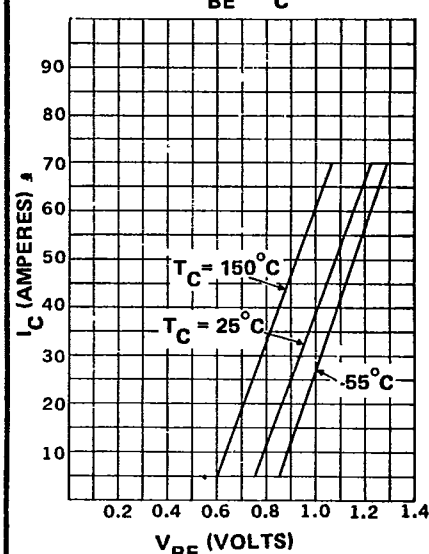


Fig. 4 POWER DISSIPATION vs TEMPERATURE

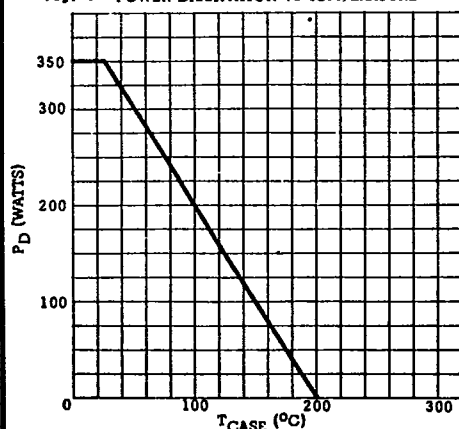


Fig. 5 SWITCHING TEST CIRCUIT

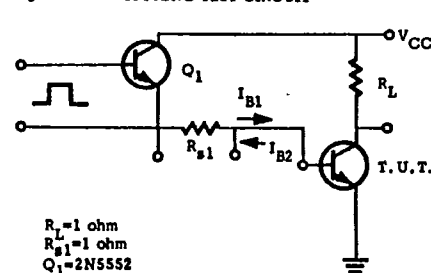
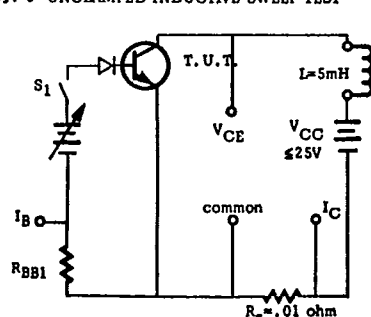


Fig. 6 UNCLAMPED INDUCTIVE SWEEP TEST



PROCEDURE
With S_1 closed, $I_C=35A$
Open S_1
 $E_S/b=1/2LI^2=2.5 \text{ Joules}$