

"BIG IDEAS IN
BIG POWER"

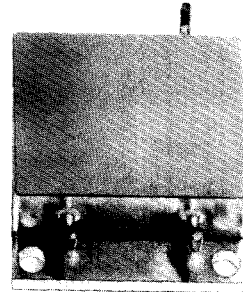
PowerTech

FET BIPOLAR POWER LINEAR®

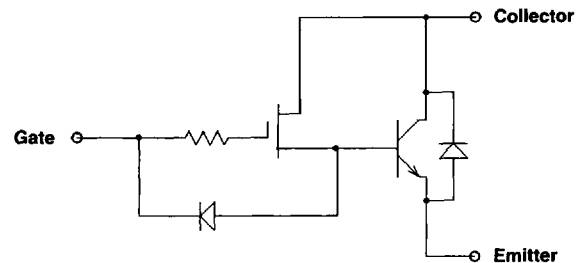
LC-1002

Maximum Ratings

V_{CES}	450 V	V_{isol}	1000 V
I_C	90 A	T_j	-55 to +175°C
P_D	350 W	T_{Stg}	-55 to +150°C
Footprint	3.3in ²	θ_{jc}	0.5°C/W
Weight	110g		



The LC-1002 Power Linear® consists of a quad FET input circuit driving a 450V, 90A bipolar output transistor. A fly-back diode is provided to allow the use of these devices as driving elements in H-bridge or 3-phase bridge circuits with inductive loads. The circuit is mounted in a welded hermetic package and meets the requirements of MIL-S-19500.



Maximum Ratings, Absolute Maximum Values

($T_c = 25^\circ\text{C}$)

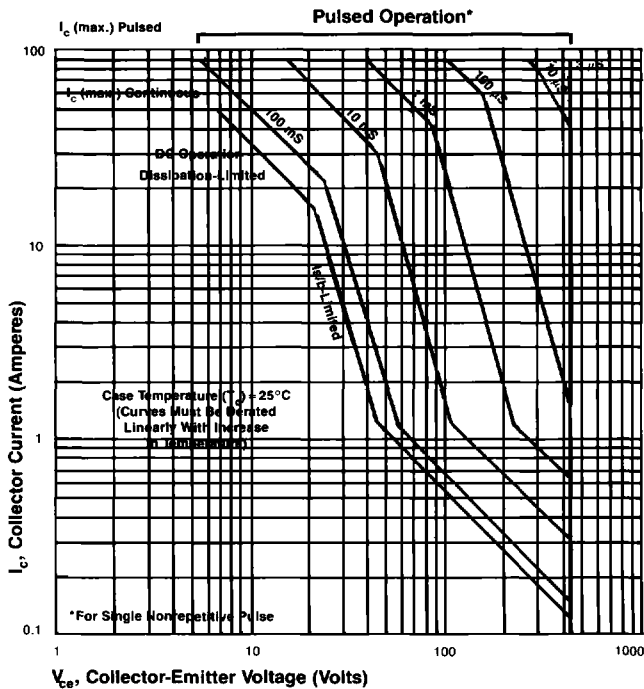
Collector-Emitter Voltage	V_{ces}	450V
Collector-Gate Voltage	V_{cgr} ($R_{gs} = 20\text{ K}\Omega$)	450V
Gate-Emitter Voltage	V_{ge}	20V
Emitter-Gate Voltage	V_{eg}	10V
Collector Current, Continuous	I_c	50A
Collector Current, Peak	I_{cm}	90A
Power Dissipation Derate Above $T_c = 25^\circ\text{C}$	P_d	350W 2.0 W/°C
Operating Temperature	T_j	-55 to +175°C
Storage Temperature	T_{Stg}	-55 to +150°C
Lead Temperature (5 secs. max., 1/8 inch min. from seal)	T_l	275°C
Collector-Case Capacitance	C_{cc}	100pF
Isolation Voltage	V_{isol}	1000V
Diode Current	I_d	70A

Electrical Characteristics

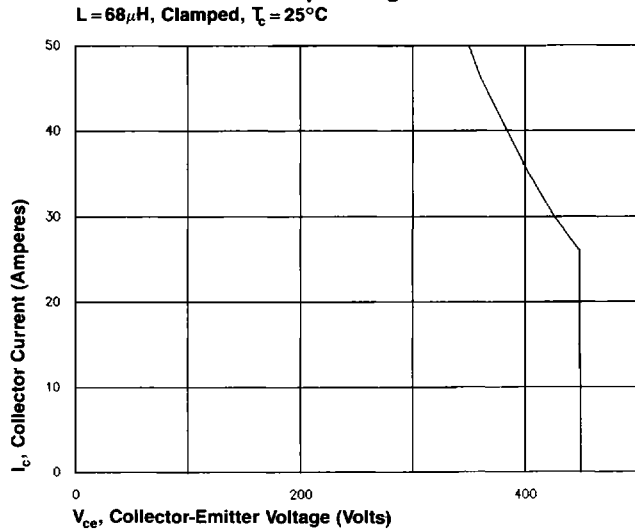
Characteristic	Symbol	Test Conditions	Min	Typ	Max	Units
Collector-Emitter Breakdown Voltage	BV_{ces} (sus)	$I_c = 25mA$ $V_{ge} = 0V$	450			V
Gate Threshold Voltage	V_{ge} (th)	$V_{ge} = V_{ce}$ $I_c = 100mA$	2.5	4.7		V
Zero Gate-Voltage Collector Current	I_{ces}	$V_{ce} = 450V$			2.0	mA
Collector Saturation Voltage	V_{ce} (sat)	$I_c = 50A$ $V_{ge} = 10V$			2.2	V
Forward Transconductance	g_{fs}	$I_c = 50A$	8	9		S
Rise Time	t_r	$I_c = 50A$ $V_{ge} = 20V$		400		nSec
Storage Time	t_s	$I_c = 50A$ $I_{b2} = 10A$		900		nSec
Fall Time	t_f	$I_c = 50A$ $I_{b2} = 10A$		800		nSec
Thermal Resistance	θ_{jc}			0.3	0.5	$^{\circ}C/W$
Forward Bias Safe Operating Area	FBSOA	$V_{ce} = 23V$ $t_p = 1 \text{ sec}$	15.2			A
Diode Forward Voltage	V_f	$I_c = 40A$			2.0	V

Pulse Width $\leq 300 \mu\text{Sec.}$, Duty Cycle $\leq 2\%$, $T_c = 25^{\circ}C$, unless otherwise specified.

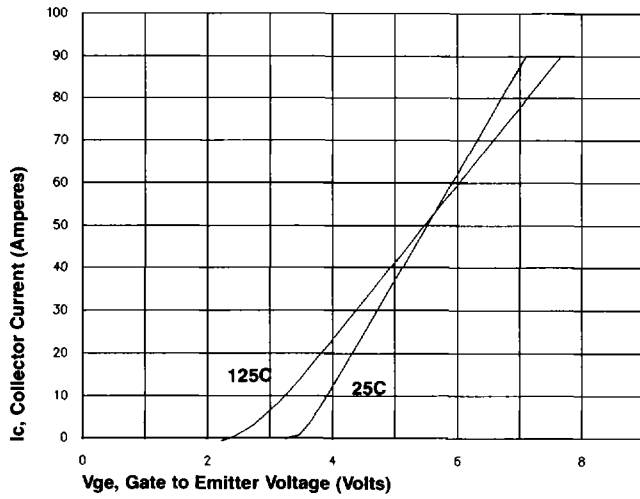
Forward Bias Safe Operating Area



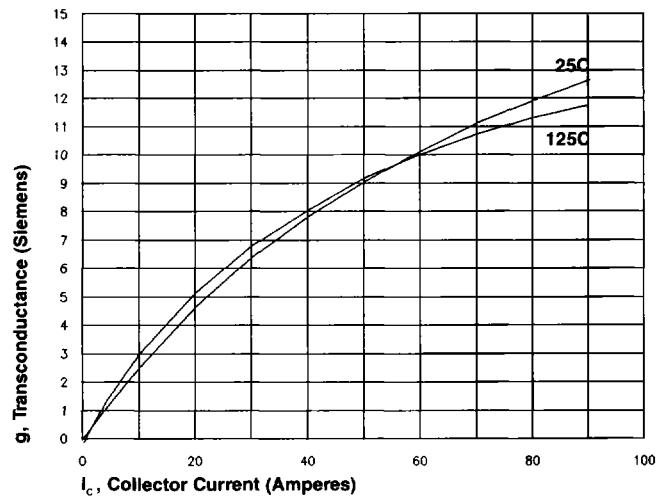
Reverse Bias Safe Operating Area



Typical Transfer Characteristic

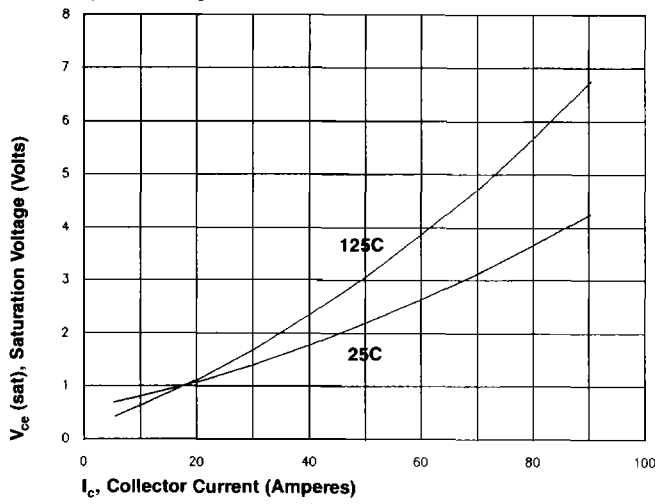


Typical Transconductance vs. I_c



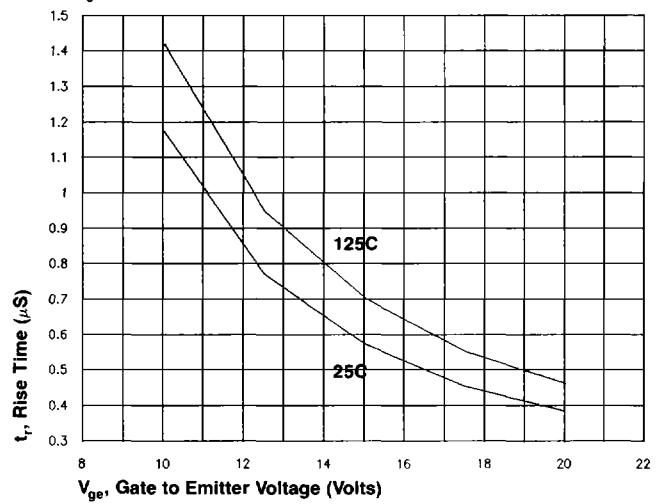
Typical $V_{ce(sat)}$ vs. I_c

$t_p = 300\mu S$, $V_{be} = 10V$



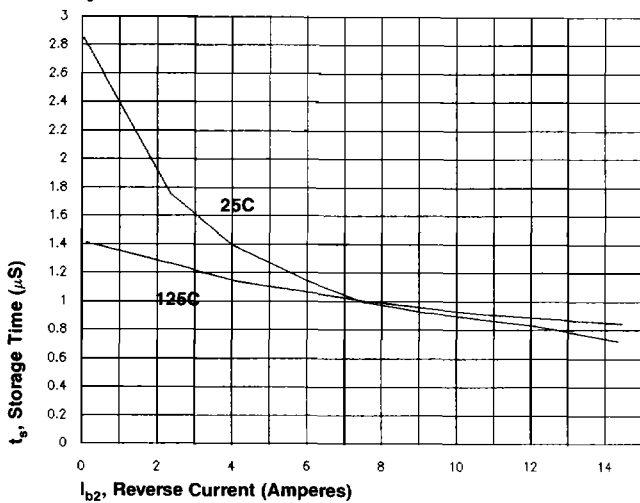
Typical Rise Time

$I_c = 50A$



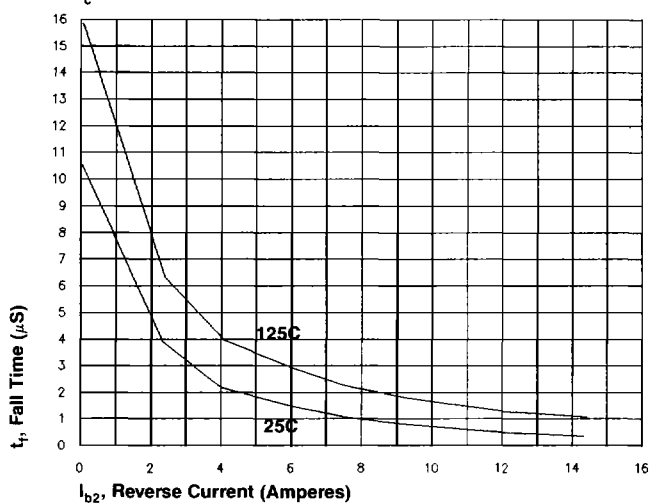
Typical Storage Time

$I_c = 50A$

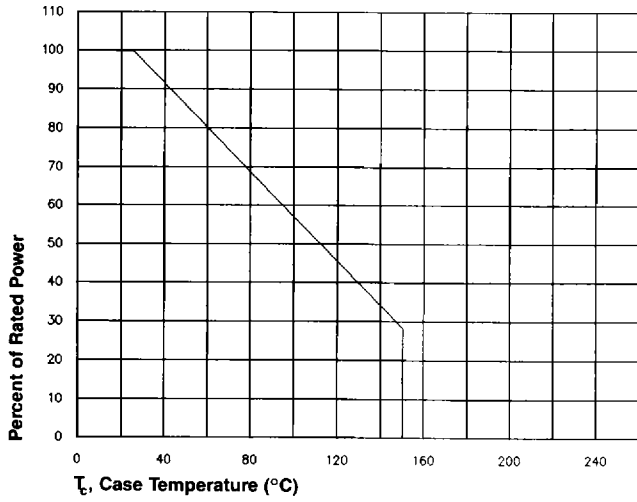


Typical Fall Time

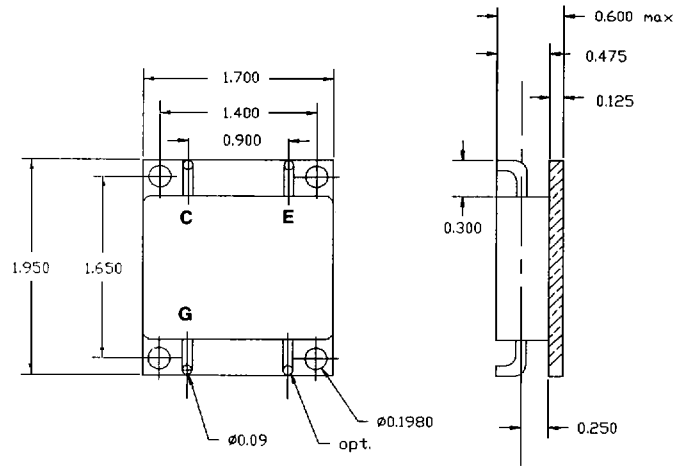
$I_c = 50A$



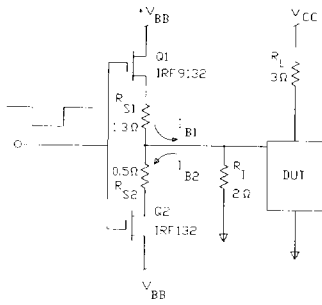
Temperature Derating



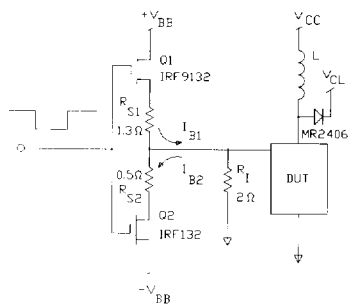
Package Dimensions



Switching Time Test Circuit



RBSOA Test Circuit



Thermal Response

