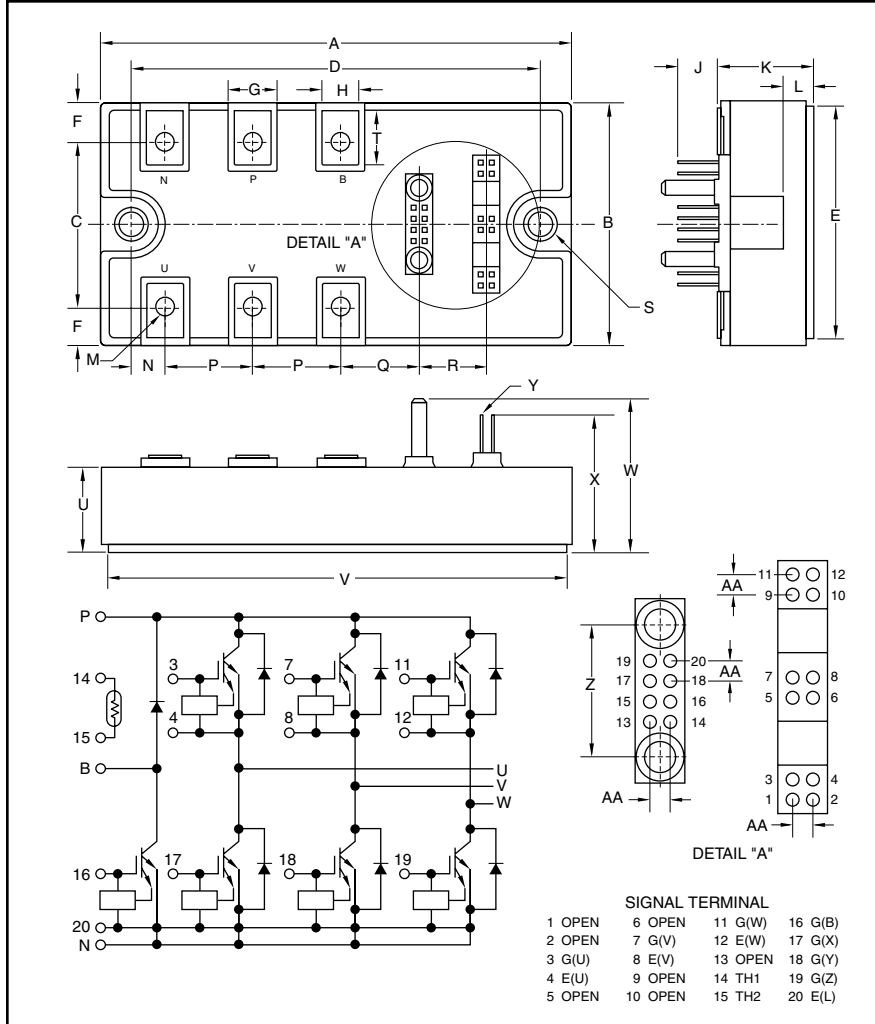


Six IGBTMOD™ + Brake Compact IGBT Series Module 150 Amperes/600 Volts



Description:

Powerex Six IGBTMOD™ + Brake Compact IGBT Series Modules are designed for use in switching applications. Each module consists of six IGBT Transistors in a three-phase bridge configuration and a seventh IGBT with a free-wheeling diode for dynamic braking. All components and interconnects are isolated from the heat sinking baseplate, offering simplified system assembly and thermal management.

Features:

- Integrated Thermistor
- Low $V_{CE(sat)}$
- Isolated Baseplate for Easy Heat Sinking

Applications:

- AC Motor Control
- Motion/Servo Control
- UPS
- Welding Power Supplies
- Laser Power Supplies

Ordering Information:

Example: Select the complete part number from the table below -i.e. MG150J7KS61 is a 600V (V_{CES}), 150 Ampere Six IGBTMOD™ + Brake Compact IGBT Series Module.

Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.21±0.04	107.0±1.0
B	2.16±0.04	55.0±1.0
C	1.50±0.03	38.0±0.8
D	3.67±0.01	93.0±0.3
E	2.05±0.02	52.0±0.5
F	0.33±0.03	8.5±0.8
G	0.43	11.0
H	0.32	8.0
J	0.38	9.5
K	0.87	22.0 -0.3/+1.0
L	0.28	7.0
M	M4	M4
N	0.23±0.03	7.5±0.8

Dimensions	Inches	Millimeters
P	0.79±0.03	20.0±0.8
Q	0.71±0.03	18.0±0.8
R	0.60±0.03	15.24±0.8
S	0.22 Dia.	5.5 Dia.
T	0.47	12.0
U	0.73±0.03	18.5±0.8
V	4.10±0.02	104.0±0.5
W	1.32-0.02/+0.04	33.5 -0.5/+1.0
X	1.24±0.03	31.5±0.8
Y	0.025	0.64
Z	0.6±0.024	15.24±0.6
AA	0.10	2.54

Type	Current Rating Amperes	V_{CES} Volts (x 10)
MG	150	60



Powerex, Inc., 200 E. Hillis Street, Youngwood, Pennsylvania 15697-1800 (724) 925-7272

MG150J7KS61
Six IGBTMOD™ + Brake
Compact IGBT Series Module
 150 Amperes/600 Volts

Absolute Maximum Ratings, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	MG150J7KS61	Units
Power Device Junction Temperature	T_j	-20 to 150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to 125	$^\circ\text{C}$
Mounting Torque, M5 Mounting Screws	—	31	in-lb
Mounting Torque, M4 Main Terminal Screws	—	13	in-lb
Module Weight (Typical)	—		Grams
Isolation Voltage, AC 1 minute, 60Hz Sinusoidal	V_{ISO}	2500	Volts

IGBT Inverter Sector

Collector-Emitter Voltage	V_{CES}	600	Volts
Gate-Emitter Voltage	V_{GES}	± 20	Volts
Collector Current ($T_C = 25^\circ\text{C}$)	I_C	150	Amperes
Peak Collector Current ($T_C = 25^\circ\text{C}$)	I_{CP}	300	Amperes
Forward Current ($T_C = 25^\circ\text{C}$)	I_F	150	Amperes
Peak Forward Current ($T_C = 25^\circ\text{C}$)	I_{EM}	300	Amperes
Collector Dissipation ($T_C = 25^\circ\text{C}$)	P_C	750	Watts

IGBT Brake Sector

Collector-Emitter Voltage ($V_D = 15\text{V}$, $V_{\text{CIN}} = 15\text{V}$)	V_{CES}	600	Volts
Gate-Emitter Voltage	V_{GES}	± 20	Volts
Collector Current ($T_C = 25^\circ\text{C}$)	I_C	75	Amperes
Peak Collector Current ($T_C = 25^\circ\text{C}$)	I_{CP}	150	Amperes
Emitter Current ($T_C = 25^\circ\text{C}$)	I_E	75	Amperes
Peak Emitter Current ($T_C = 25^\circ\text{C}$)	I_{EM}	150	Amperes
Collector Dissipation ($T_C = 25^\circ\text{C}$)	P_C	375	Watts
Reverse Voltage	V_R	600	Volts



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Electrical and Mechanical Characteristics, $T_j = 25^\circ\text{C}$ unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
IGBT Inverter Sector						
Gate Leakage Current	I_{GES}	$V_{GE} = 20\text{V}, V_{CE} = 0$	—	—	±500	nA
Collector-Emitter Cutoff Current	I_{CES}	$V_{CE} = 600, V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cutoff Voltage	$V_{GE(off)}$	$V_{CE} = 5\text{V}, I_C = 150\text{mA}$	5.0	6.5	8.0	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE} = 15\text{V}, I_C = 150\text{A}, T_j = 25^\circ\text{C}$	—	1.8	2.3	Volts
		$V_{GE} = 15\text{V}, I_C = 200\text{A}, T_j = 125^\circ\text{C}$	—	—	2.5	Volts
Input Capacitance	C_{ies}	$V_{CE} = 10\text{V}, V_{GE} = 0, f = 1\text{MHz}$	—	30,000	—	pF
Inductive Load	$t_{d(on)}$		—	—	1.0	μs
Switching	t_{off}	$V_{CC} = 300\text{V}, I_C = 150\text{A},$	—	—	1.2	μs
Times	t_f	$V_{GE} = \pm 15\text{V}, R_G = 15\Omega$	—	—	0.5	μs
Reverse Recovery Time	t_{rr}		—	—	0.3	μs
Emitter-Collector Voltage	V_E	$I_E = 150\text{A}$	—	2.4	2.8	Volts

IGBT Brake Sector

Gate Leakage Current	I_{GES}	$V_{GE} = \pm 20\text{V}, V_{CE} = 0$	—	—	±500	nA
Collector-Emitter Cutoff Current	I_{CES}	$V_{CE} = 600, V_{GE} = 0$	—	—	1.0	mA
Gate-Emitter Cutoff Voltage	$V_{GE(off)}$	$V_{CE} = 5\text{V}, I_C = 75\text{mA}$	5.0	6.5	8.0	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE} = 15\text{V}, I_C = 75\text{A}, T_j = 25^\circ\text{C}$	—	1.8	2.2	Volts
		$V_{GE} = 15\text{V}, I_C = 75\text{A}, T_j = 125^\circ\text{C}$	—	—	2.2	Volts
Input Capacitance	C_{ies}	$V_{CE} = 10\text{V}, V_{GE} = 0, f = 1\text{MHz}$	—	15,000	—	pF
Inductive Load	$t_{d(on)}$		—	—	1.0	μs
Switching	t_{off}	$V_{CC} = 300\text{V}, I_C = 75\text{A},$	—	—	1.2	μs
Times	t_f	$V_{GE} = \pm 15\text{V}, R_G = 24\Omega$	—	—	0.5	μs
Reverse Recovery Current	I_R	$V_R = 600\text{V}$	—	—	1.0	mA
Emitter-Collector Voltage	V_E	$I_E = 75\text{A}$	—	2.1	2.6	Volts

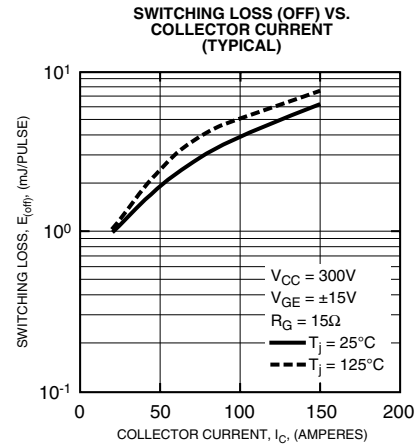
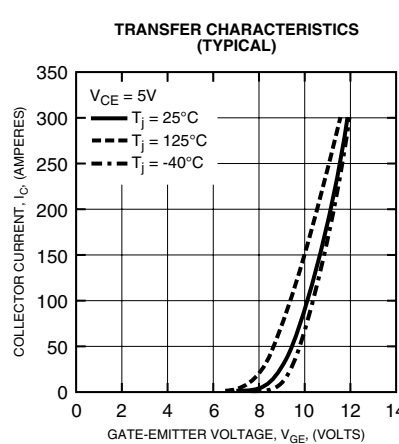
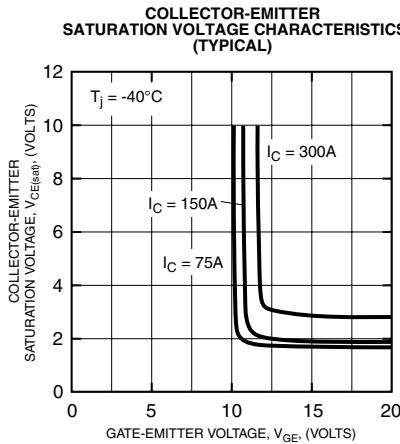
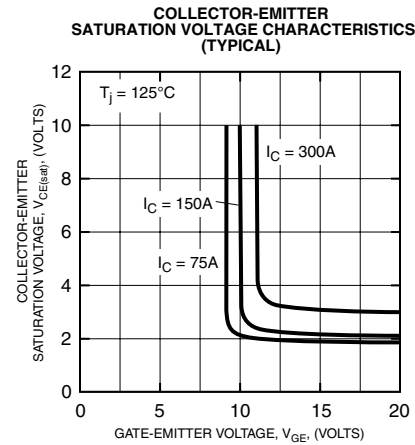
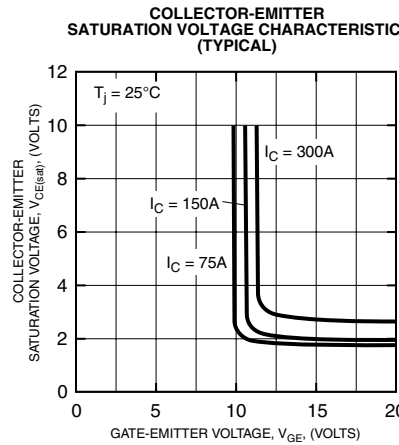
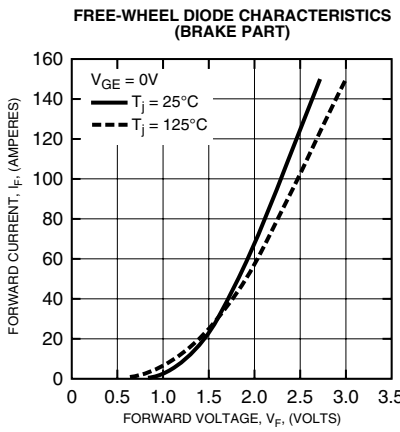
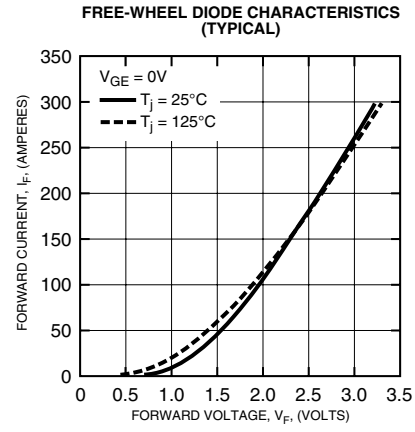
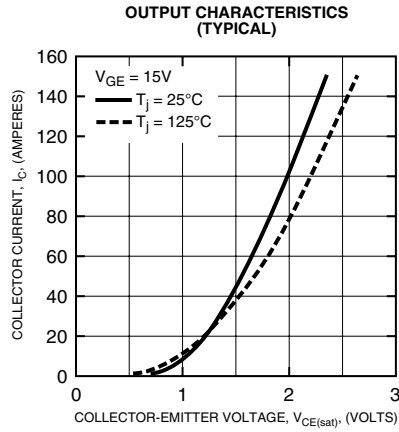
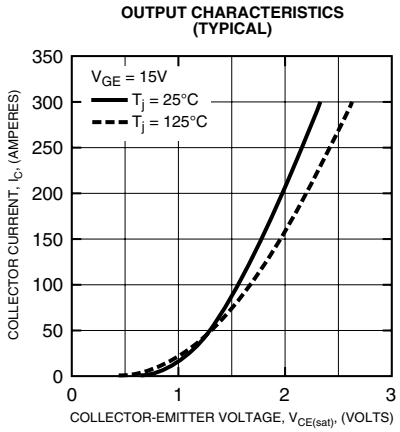
Thermal Characteristics

Characteristic	Symbol	Condition	Min.	Typ.	Max.	Units
Zero Power Resistance	R25	$I_{TM} = 0.2\text{mA}$	—	100	—	kΩ
B Value	B25/85	$T_C = 25^\circ\text{C}/T_C = 85^\circ\text{C}$	—	4390	—	K
Junction to Case Thermal Resistance	$R_{th(j-c)Q}$	Inverter IGBT (Per 1/6 Module)	—	—	0.167	°C/Watt
	$R_{th(j-c)D}$	Inverter FWDi (Per 1/6 Module)	—	—	0.313	°C/Watt
	$R_{th(j-c)Q}$	Brake IGBT (Per 1/6 Module)	—	—	0.333	°C/Watt
	$R_{th(j-c)D}$	Brake FWDi (Per 1/6 Module)	—	—	1.000	°C/Watt
Contact Thermal Resistance	$R_{th(c-f)}$	—	—	0.05	—	°C/Watt

Recommended Conditions for Use

Characteristic	Symbol	Condition	Value	Units
Supply Voltage	V_{CC}	Applied across P-N Terminals	≤400	Volts
Gate Voltage	V_{GE}	—	13.5 ~ 16.5	Volts
Switching Frequency	f_C	—	0 ~ 20	kHz

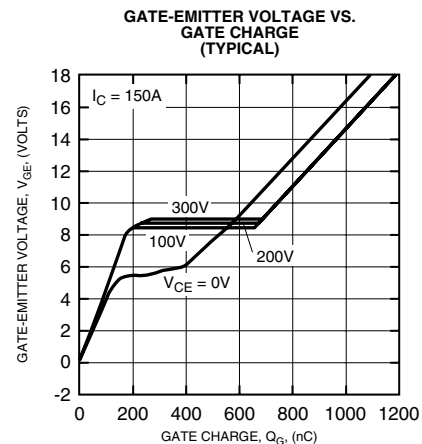
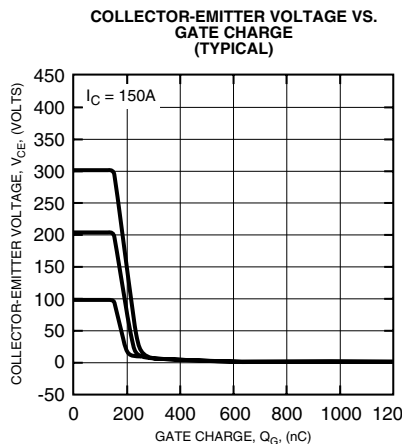
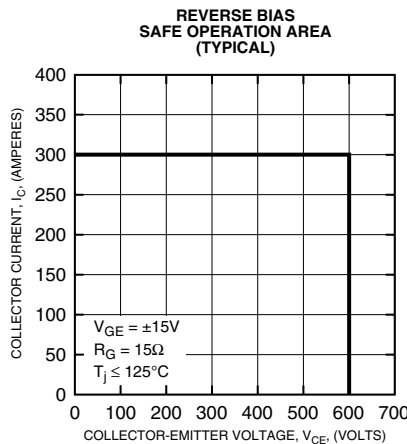
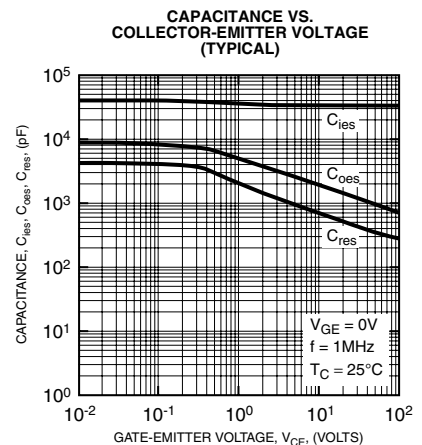
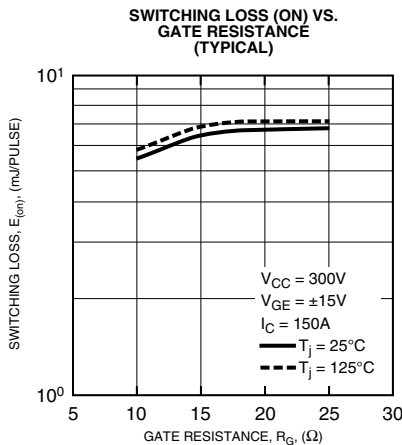
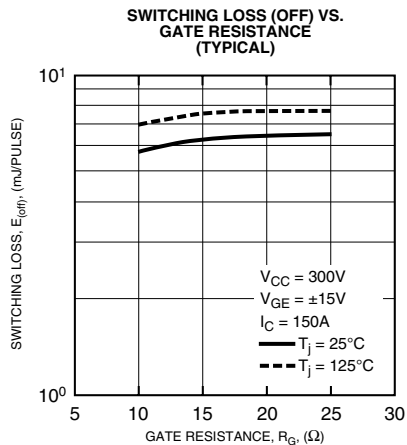
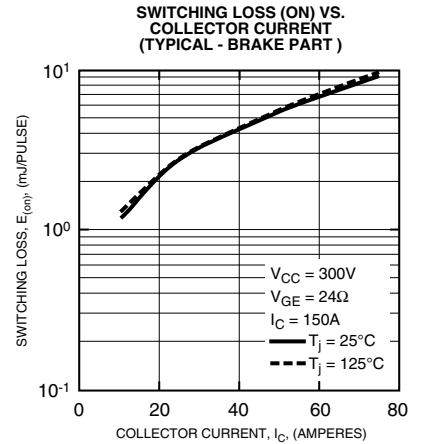
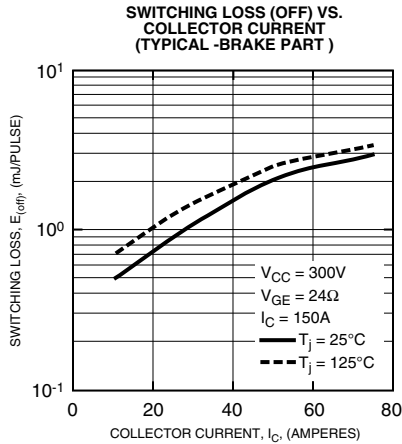
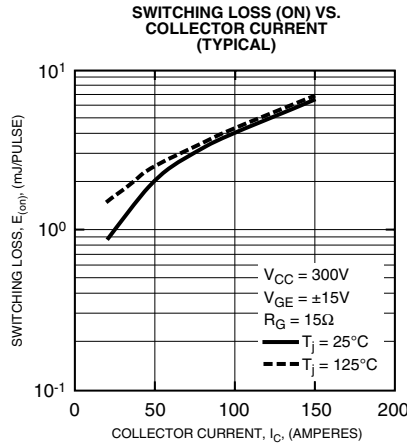
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