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[Powerex Inc.](#)
[PM75CSD060](#)

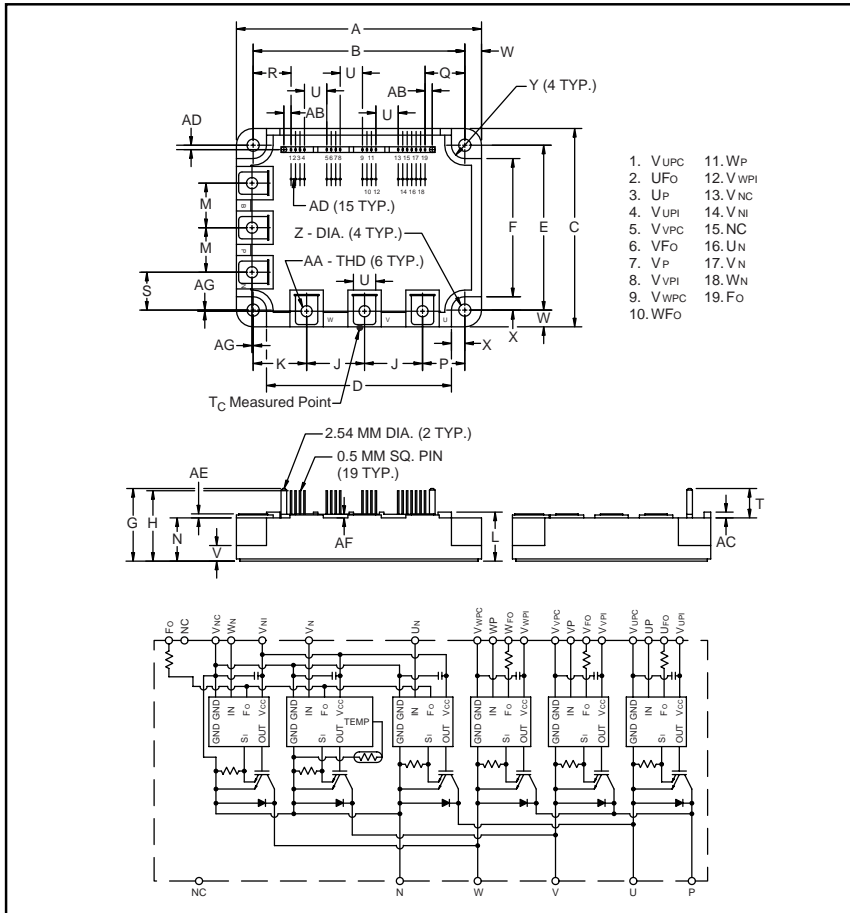
For any questions, you can email us directly:
sales@integrated-circuit.com



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

PM75CSD060

Intellimod™ Module
Three Phase
IGBT Inverter Output
75 Amperes/600 Volts



Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	4.33±0.04	110.0±1.0
B	3.74±0.02	95.0±0.5
C	3.50±0.04	89.0±1.0
D	3.27	83.0
E	2.91±0.02	74.0±0.5
F	2.44	62.0
G	1.28	32.6
H	1.24	31.6
J	1.02	26.0
K	0.94	24.0
L	0.87 +0.06/-0	22.0 +1.5/-0.0
M	0.79	20.0
N	0.76	19.4
P	0.75	19.0
Q	0.708	17.98
R	0.670	17.02

Dimensions	Inches	Millimeters
S	0.67	17.0
T	0.52	13.2
U	0.39	10.0
V	0.28	7.0
W	0.30	7.5
X	0.24	6.0
Y	0.24 Rad.	Rad. 6.0
Z	0.22 Dia.	Dia. 5.5
AA	Metric M5	M5
AB	0.127	3.22
AC	0.10	2.6
AD	0.08±0.02	2.0±0.5
AE	0.07	1.8
AF	0.06	1.6
AG	0.02±0.01	0.5±0.3



Description:

Powerex Intellimod™ Intelligent Power Modules are isolated base modules designed for power switching applications operating at frequencies to 20kHz. Built-in control circuits provide optimum gate drive and protection for the IGBT and free-wheel diode power devices.

Features:

- Complete Output Power Circuit
- Gate Drive Circuit
- Protection Logic
 - Short Circuit
 - Over Current
 - Over Temperature
 - Under Voltage
- Low Loss Using 4th Generation IGBT Chip

Applications:

- Inverters
- UPS
- Motion/Servo Control
- Power Supplies

Ordering Information:

Example: Select the complete part number from the table below -i.e. PM75CSD060 is a 600V, 75 Ampere Intellimod™ Intelligent Power Module.

Type	Current Rating Amperes	V _{CES} Volts (x 10)
PM	75	60



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

Characteristics	Symbol	PM75CSD060	Units
Power Device Junction Temperature	T_j	-20 to 150	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to 125	$^\circ\text{C}$
Case Operating Temperature	T_C	-20 to 100	$^\circ\text{C}$
Mounting Torque, M5 Mounting Screws	—	31	in-lb
Mounting Torque, M5 Main Terminal Screws	—	31	in-lb
Module Weight (Typical)	—	560	Grams
Supply Voltage Protected by OC and SC ($V_D = 13.5 - 16.5\text{V}$, Inverter Part) $T_j = 125^\circ\text{C}$	$V_{CC(prot.)}$	400	Volts
Isolation Voltage, AC 1 minute, 60Hz Sinusoidal	V_{ISO}	2500	Volts

IGBT Inverter Sector

Collector-Emitter Voltage ($V_D = 15\text{V}$, $V_{CIN} = 15\text{V}$)	V_{CES}	600	Volts
Collector Current, \pm ($T_C = 25^\circ\text{C}$)	I_C	75	Amperes
Peak Collector Current, \pm ($T_C = 25^\circ\text{C}$)	I_{CP}	150	Amperes
Supply Voltage (Applied between P - N)	V_{CC}	400	Volts
Supply Voltage, Surge (Applied between P - N)	$V_{CC(surge)}$	500	Volts
Collector Dissipation ($T_C = 25^\circ\text{C}$)	P_C	255	Watts

Control Sector

Supply Voltage Applied between ($V_{UP1}-V_{UPC}$, $V_{VP1}-V_{VPC}$, $V_{WP1}-V_{WPC}$, $V_{N1}-V_{NC}$)	V_D	20	Volts
Input Voltage Applied between (U_P-V_{UPC} , V_P-V_{VPC} , W_P-V_{WPC} , U_N-V_{NC} , W_N-V_{NC})	V_{CIN}	20	Volts
Fault Output Supply Voltage (Applied between F_O and V_C)	V_{FO}	20	Volts
Fault Output Current (U_{FO} , V_{FO} , W_{FO} , F_O)	I_{FO}	20	mA

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

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
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IGBT Inverter Sector

Collector Cutoff Current	I_{CES}	$V_{CE} = V_{CES}$, $T_j = 25^\circ\text{C}$, $V_D = 15\text{V}$, $V_{CIN} = 15\text{V}$	—	—	1.0	mA
		$V_{CE} = V_{CES}$, $T_j = 125^\circ\text{C}$, $V_D = 15\text{V}$, $V_{CIN} = 15\text{V}$	—	—	10	mA
Diode Forward Voltage	V_{EC}	$-I_C = 75\text{A}$, $V_D = 15\text{V}$, $V_{CIN} = 15\text{V}$	—	2.2	3.3	Volts
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_D = 15\text{V}$, $V_{CIN} = 0\text{V}$, $I_C = 75\text{A}$, $T_j = 25^\circ\text{C}$	—	1.70	2.3	Volts
		$V_D = 15\text{V}$, $V_{CIN} = 0\text{V}$, $I_C = 75\text{A}$, $T_j = 125^\circ\text{C}$	—	1.70	2.3	Volts
Inductive Load Switching Times	t_{on}		0.8	1.2	2.4	μS
	t_{rr}	$V_D = 15\text{V}$, $V_{CIN} = 0 \sim 15\text{V}$	—	0.15	0.3	μS
	$t_{C(on)}$	$V_{CC} = 300\text{V}$, $I_C = 75\text{A}$	—	0.4	1.0	μS
	t_{off}	$T_j = 125^\circ\text{C}$	—	2.4	3.3	μS
	$t_{C(off)}$		—	0.6	1.2	μS



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Electrical and Mechanical Characteristics, T_j = 25°C unless otherwise specified

Characteristics	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Control Sector						
Over Current Trip Level Inverter Part (V _D = 15V)	OC	T _j = -20°C	—	—	380	Amperes
		T _j = 25°C	192	226	320	Amperes
		T _j = 125°C	115	—	—	Amperes
Short Circuit Trip Level Inverter Part	SC	-20°C ≤ T _j ≤ 125°C, V _D = 15V	—	241	—	Amperes
Over Current Delay Time	t _{off} (OC)	V _D = 15V	—	10	—	μS
Over Temperature Protection (V _D = 15V) (Lower Arm)	OT	Trip Level	111	118	125	°C
	OT _R	Reset Level	—	100	—	°C
Supply Circuit Under Voltage Protection (-20 ≤ T _j ≤ 125°C)	UV	Trip Level	11.5	12.0	12.5	Volts
	UV _R	Reset Level	—	12.5	—	Volts
Circuit Current	I _D	V _D = 15V, V _{CI} N = 15V, V _{N1} -V _{NC}	—	40	55	mA
		V _D = 15V, V _{CI} N = 15V, V _{XP1} -V _{XPC}	—	13	18	mA
Input ON Threshold Voltage	V _{CI} N(on)	Applied between	1.2	1.5	1.8	Volts
Input OFF Threshold Voltage	V _{CI} N(off)	U _P , V _P , W _P , U _N , V _N , W _N -V _{NC}	1.7	2.0	2.3	Volts
Fault Output Current*	I _{FO} (H)	V _D = 15V, V _{CI} N = 15V	—	—	0.01	mA
	I _{FO} (L)	V _D = 15V, V _{CI} N = 15V	—	10	15	mA
Minimum Fault Output Pulse Width*	t _{FO}	V _D = 15V	1.0	1.8	—	mS

*Fault output is given only when the internal OC, SC, OT and UV protections schemes of either upper or lower device operate to protect it.

Thermal Characteristics

Characteristic	Symbol	Condition	Min.	Typ.	Max.	Units
Junction to Case Thermal Resistance	R _{th(j-c)} Q	Each IGBT	—	—	0.49	°C/Watt
	R _{th(j-c)} F	Each FWDi	—	—	1.38	°C/Watt
	R _{th(j-c)} Q	Each IGBT**	—	—	0.30 [†]	°C/Watt
	R _{th(j-c)} F	Each FWDi**	—	—	0.47 [†]	°C/Watt
Contact Thermal Resistance	R _{th(c-f)}	Case to Fin Per Module, Thermal Grease Applied	—	—	0.027	°C/Watt

[†] T_C measured point is just under chip.

**If you use this value, R_{th(f-a)} should be measured just under the chips.

Recommended Conditions for Use

Characteristic	Symbol	Condition	Value	Units
Supply Voltage	V _{CC}	Applied across P-N Terminals	0 ~ 400	Volts
Control Supply Voltage***	V _D	Applied between V _{UP1} -V _{UPC} ,	15 ± 1.5	Volts
		V _{N1} -V _{NC} , V _{VP1} -V _{VPC} , V _{WP1} -V _{WPC}		
Input ON Voltage	V _{CI} N(on)	Applied between	0 ~ 0.8	Volts
Input OFF Voltage	V _{CI} N(off)	U _P , V _P , W _P , U _N , V _N , W _N -V _{NC}	4.0 ~ V _D	Volts
PWM Input Frequency	f _{PWM}	Using Application Circuit	0 ~ 20	kHz
Minimum Dead Time	t _{DEAD}	Input Signal	≥ 2.5	μS

*** With ripple satisfying the following conditions: dv/dt swing ≤ ±5V/μs, Variation ≤ 2V peak to peak.



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