



Solid State Devices, Inc.

14701 Firestone Blvd * La Mirada, CA 90638
 Phone: (562) 404-4474 * Fax: (562) 404-1773
 ssdi@ssdi-power.com * www.ssdi-power.com

SPMQ613-01

**600V, 200A FAST SWITCHING IGBT
 HALF BRIDGE**

Designer's Data Sheet

Part Number/Ordering Information ^{1/}

SPMQ613-01

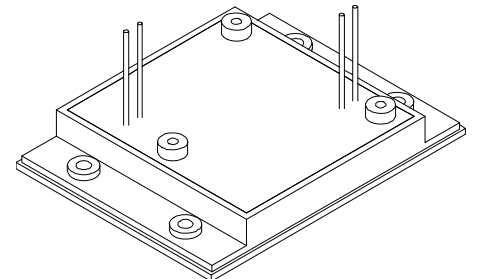
Screening ^{2/}

 = Not Screened
TX = TX Level
TXV = TXV Level
S = S Level

- FEATURES:**
- Hermetic construction, electrically isolated from the heatsinking baseplate
 - Fast switching
 - Single IGBT die (no paralleling) with ultrafast freewheeling diode
 - Low switching and conduction losses
 - TX, TXV, and Space Level Screening Available

MAXIMUM RATINGS ^{3/}	SYMBOL	VALUE	UNIT
Collector – Emitter Breakdown Voltage	V_{CES}	600	V
Gate – Emitter Voltage	V_{GES}	±20	V
Max. Continuous Collector Current	I_{C1} I_{C2}	200 100	A
		@ $T_c = 25^\circ C$ @ $T_c = 90^\circ C$	
Pulsed Collector Current	I_{CM}	300	A
Clamped Inductive Load Current ($T_J = 125^\circ C$)	I_{LM}	100	A
Reverse Voltage Avalanche Energy ($I_C = 100A$)	E_{ARV}	5.6	mJ
Operating & Storage Temperature	T_{OP} & T_{STG}	-55 to +150	°C
Maximum Thermal Resistance (Junction to Case) Per switch	$R_{\theta JC}$	0.50	°C/W
Total Device Dissipation @ $T_c = 25^\circ C$	P_{D1}	250	W
Dissipation Derating From @ $T_c = 25^\circ C$ to $T_c = 150^\circ C$	P_{D2}	2	W/°C

Notes: ^{1/} For ordering information, price, and availability- Contact factory.
^{2/} Screening based on MIL-PRF-19500. Screening flows available on request.
^{3/} Unless otherwise specified, all electrical characteristics @25°C.





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ELECTRICAL CHARACTERISTICS ^{3/}		SYMBOL	MIN	TYP	MAX	UNIT	
Collector - Emitter Breakdown Voltage ($I_{CES} = 250\mu A, V_{GE} = 0V$)		BV_{CES}	600	670	—	V	
Gate - Emitter Threshold Voltage ($I_C = 0.25mA, V_{CE} = V_{GE}$)		$V_{GE(th)}$	$T_A = 25^\circ C$	2.5	5.2	6	V
			$T_A = 125^\circ C$	-	5.0	-	
			$T_A = -55^\circ C$	-	6.0	-	
Collector - Emitter Saturation Voltage		$V_{CE(on)}$	$I_C = 100A @ 25^\circ C$	—	1.70	2.4	V
			$I_C = 150A @ 25^\circ C$	—	2.15	-	
			$I_C = 200A @ 25^\circ C$	—	2.35	-	
			$I_C = 300A @ 25^\circ C$	—	3.00	-	
			$I_C = 100A @ 125^\circ C$	—	1.65	2.2	
			$I_C = 200A @ 125^\circ C$	—	2.20	-	
			$I_C = 300A @ 125^\circ C$	—	2.70	-	
			$I_C = 100A @ -55^\circ C$	—	1.70	-	
			$I_C = 200A @ -55^\circ C$	—	2.25	-	
		$I_C = 300A @ -55^\circ C$	—	2.90	-		
Gate - Emitter Leakage Current ($V_{GE} = \pm 20V, V_{CE} = 0V$)		I_{GES}	$T_A = 25^\circ C$	—	0.01	1.0	μA
			$T_A = 125^\circ C$	—	0.05	10	
			$T_A = -55^\circ C$	—	0.005	-	
Collector Leakage Current ($V_{CE} = 600V, V_{GE} = 0V$)		I_{CES1} I_{CES2} I_{CES3}	$T_A = 25^\circ C$	—	25	200	μA
			$T_A = 125^\circ C$	—	7	—	mA
			$T_A = -55^\circ C$	—	2.5	-	μA
Forward Transconductance ($I_C = I_{C2}, V_{CE} = 10V$)		g_{fs}	20	—	—	S	
Gate Charge		$Q_{g(on)}$ Q_{ge} Q_{gc}	$V_{GE} = 15V$	—	575	650	nC
Total Gate Charge			$I_C = 10A$	—	70	150	
Gate-Emitter Charge			$V_{CE} = 300V$	—	320	370	
Gate-Collector Charge							
Capacitance		C_{ies} C_{oes} C_{res}	$V_{GE} = 0V$	—	84001	10,000	pF
Input Capacitance			$V_{CE} = 25V$	—	400	2,000	
Output Capacitance			$f = 1MHz$	—	600	1,000	
Reverse Transfer Capacitance							
Resistive Switching		$t_{d(on)}$ t_r $t_{d(off)}$ t_f	$V_{CC} = 300V$	—	150	-	nsec
Turn-On Delay Time			$V_{GE} = 15V$	—	550	-	
Rise Time			$I_C = 40A$	—	550	-	
Turn-Off Delay Time				—	2000	-	
Fall Time							
Inductive Switching		$t_{d(on)}$ t_r $t_{d(off)}$ t_f	$V_{CC} = 300V$	—	150	500	nsec
Turn-On Delay Time			$V_{GE} = 15V$	—	140	175	
Rise Time			$I_C = 45A$	—	600	1000	
Turn-Off Delay Time			$R_G = 10\Omega$	—	300	500	
Fall Time			$L = 100\mu H$	—			
ANTI-PARALLEL DIODE							
Peak Current		I_{pk}	—	—	200	A	
Peak Inverse Voltage		PIV	—	—	600	V	
Average Current		I_{avg}	—	—	100	A	
Diode Forward Voltage @ $I_F=100A, T_J=25^\circ C$		VF	$I_F = 100A, T_A = 25^\circ C$	—	1.1	1.5	V
			$I_F = 300A, T_A = 25^\circ C$	—	1.6	-	
			$I_F = 300A, T_A = -55^\circ C$	—	1.8	-	
			$I_F = 300A, T_A = 125^\circ C$	—	1.4	-	
Reverse Recovery Time ($I_f=40A, di/dt=200A/\mu sec$)		trr	—	200	2000	nsec	

NOTE: All specifications are subject to change without notification.
 SCD's for these devices should be reviewed by SSDI prior to release.

DATA SHEET #: PM0027A

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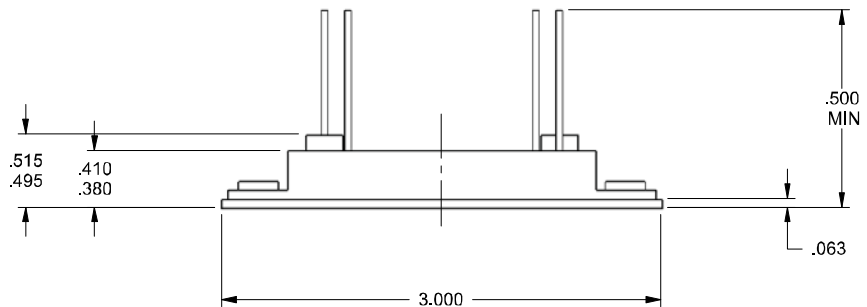
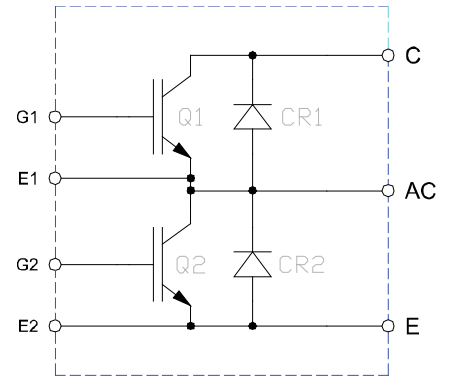
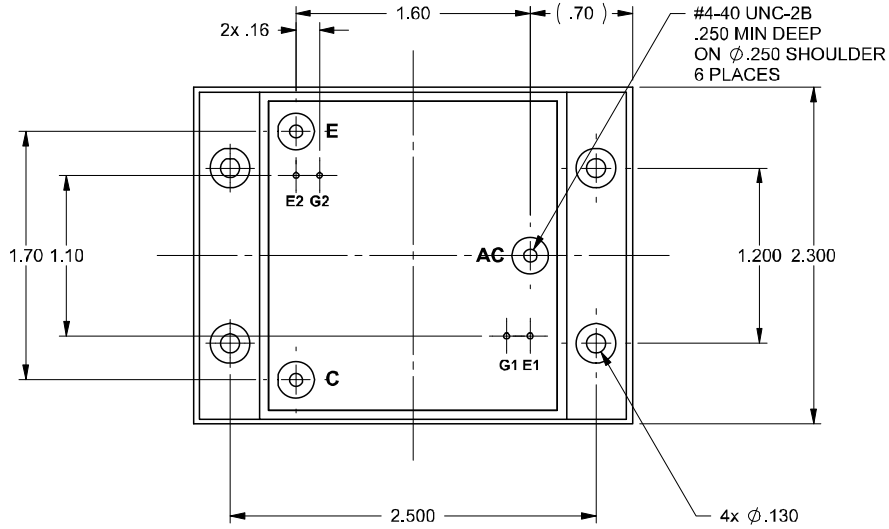
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CASE OUTLINE: ASPM



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