Solid State Devices, Inc.
14701 Firestone Blvd * La Mirada, CA 90638
Phone: (562) 404-4474 * Fax: (562) 404-1773
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SPMQ613-01

600V, 200A FAST SWITCHING IGBT HALF BRIDGE

Designer's Data Sheet

Part Number/Ordering Information 1/

SPMQ613-01 __

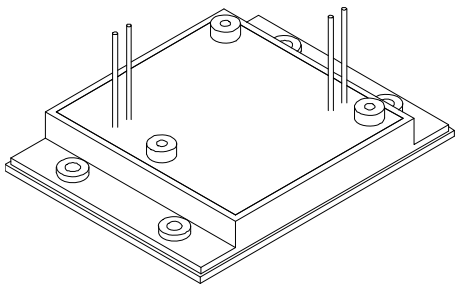
└ **Screening** 2/
__ = Not Screened
TX = TX Level
TXV = TXV Level
S = S Level

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	@ T_C = 25ºC @ T_C = 90ºC	I_{C1} I_{C2}	200 100	A
Pulsed Collector Current		I_{CM}	300	A
Clamped Inductive Load Current (T_J = 125ºC)		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	ºC
Maximum Thermal Resistance (Junction to Case)	**Per switch**	$R_{\theta JC}$	0.50	ºC/W
Total Device Dissipation @ T_C = 25ºC **Dissipation Derating From @ T_C = 25ºC to T_C = 150ºC**		P_{D1} P_{D2}	250 2	W W/ºC

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 @25ºC.



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

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CASE OUTLINE: ASPM