



Solid State Devices, Inc.

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SPMQ613-02

600V, 400A FAST SWITCHING IGBT HALF BRIDGE

Designer's Data Sheet

Part Number/Ordering Information ^{1/}

SPMQ613-02

Screening ^{2/}

— = Not Screened

TX = TX Level

TXV = TXV

S = S Level

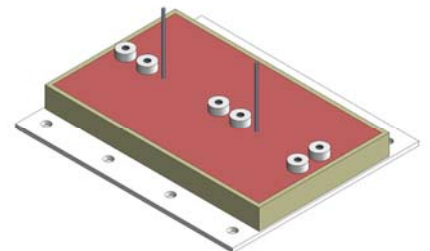
FEATURES:

- Hermetic construction, electrically isolated from the heatsinking baseplate
- Fast switching
- dual IGBT die 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}	400 200	A
Pulsed Collector Current	I_{CM}	600	A
Clamped Inductive Load Current ($T_J = 125^{\circ}C$)	I_{LM}	200	A
Reverse Voltage Avalanche Energy ($I_C = 100A$)	E_{ARV}	10	mJ
Operating & Storage Temperature	T_{OP} & T_{STG}	-55 to +150	°C
Maximum Thermal Resistance (Junction to Case) Per switch	$R_{\theta JC}$	0.25	°C/W
Total Device Dissipation @ $T_C = 25^{\circ}C$ Dissipation Derating From @ $T_C = 25^{\circ}C$ to $T_C = 150^{\circ}C$	P_{D1} P_{D2}	500 1	W 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.



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

DATA SHEET #: PM0028A

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ELECTRICAL CHARACTERISTICS ^{3/}		SYMBOL	MIN	TYP	MAX	UNIT
Collector - Emitter Breakdown Voltage ($I_{CES} = 500\mu A$, $V_{GE} = 0V$)		BV_{CES}	600	670	—	V
Gate - Emitter Threshold Voltage ($I_C = 0.5mA$, $V_{CE} = V_{GE}$)		$V_{GE(th)}$	2.5 - -	5.2 5.0 6.0	6 - -	V
Collector - Emitter Saturation Voltage $I_C = 200A @ 25^\circ C$ $I_C = 300A @ 25^\circ C$ $I_C = 400A @ 25^\circ C$ $I_C = 200A @ 125^\circ C$ $I_C = 400A @ 125^\circ C$ $I_C = 200A @ -55^\circ C$ $I_C = 400A @ -55^\circ C$		$V_{CE(on)}$	— —	1.70 2.15 2.35 1.65 2.20 1.70 2.25	2.4 - - 2.2 - - -	V
Gate - Emitter Leakage Current ($V_{GE} = \pm 20V$, $V_{CE} = 0V$)		I_{GES}	—	0.02 0.1 0.01	1.0 10 -	μA
Collector Leakage Current ($V_{CE} = 600V$, $V_{GE} = 0V$)		I_{CES1} I_{CES2} I_{CES3}	— — —	50 7 2.5	400 — -	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		$Q_{g(on)}$ Q_{ge} Q_{gc}	— — —	1200 150 650	1500 300 750	nC
Capacitance Input Capacitance Output Capacitance Reverse Transfer Capacitance		C_{ies} C_{oes} C_{res}	— — —	17,000 3000 1200	20,000 4,000 2,000	pF
Resistive Switching Turn-On Delay Time Rise Time Turn-Off Delay Time Fall Time		$t_{d(on)}$ 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		$t_{d(on)}$ t_r $t_{d(off)}$ t_f	— — — —	150 140 600 300	500 175 1000 500	nsec
ANTI-PARALLEL DIODE						
Peak Current		I_{pk}	—	—	400	A
Peak Inverse Voltage		PIV	—	—	600	V
Average Current		I_{avg}	—	—	200	A
Diode Forward Voltage @ $I_F=100A$, $T_J=25^\circ C$ $I_F = 200A$, $T_A = 25^\circ C$ $I_F = 600A$, $T_A = 25^\circ C$ $I_F = 600A$, $T_A = -55^\circ C$ $I_F = 600A$, $T_A = 125^\circ C$		V_F	—	1.1 1.6 1.8 1.4	1.5 - - -	V
Reverse Recovery Time ($I_F=40A$, $di/dt=200A/\mu sec$)		t_{rr}	—	200	2000	nsec

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CASE OUTLINE: ASPM

