Solid State Devices, Inc.
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SPMR600-01

SPACE LEVEL
SHUNT MODULE

Designer's Data Sheet

Part Number/Ordering Information 1/

SPMR600-01 —

— **Screening** 2/
— = Not Screened
TX = TX Level
TXV = TXV
S = S Level

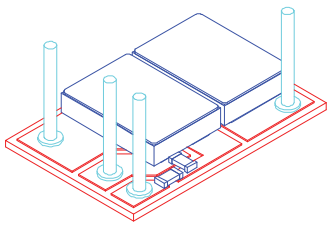
FEATURES:

- Space Level Power Supply Applications
- Compact and Rugged Construction Offering Weight and Space Savings
- Very Low Mechanical Stress and Thermal Resistance
- Hermetic Sealed Discrete Elements
- Excellent Thermal Management
- TX, TXV, and Space Level Screening Available

150V Schottky section: Maximum Ratings		Symbol	Value	Units
Peak Surge Reverse Voltage		V_{RSM}	150	V
Peak Repetitive Reverse Voltage		V_{RRM}	150	V
Average Rectified Forward Current (Resistive Load, 60 Hz Sine Wave, T_A = 25 °C)		I_O I_{D2}	40	A
Non-repetitive Peak Surge Current (8.3 ms Pulse, Half Sine Wave)	@ T_C = 25°C	I_{FSM}	600	A
Max. Avalanche repetitive reverse current	@ 1.5 x V_{RRM}	I_{AR}	0.6	A
Non-repetitive Avalanche Energy	@ I_{AS}= 6A L= 0.1 mH	E_{AS}	0.6	mJ
Total Power Dissipation	@ T_C = 25ºC	P_D	TBD	W
Operating & Storage Temperature		T_{OP} & T_{STG}	-55 to+175	°C

150V Schottky section: Electrical Characteristics		Symbol	Min	Typ	Max	Units
Instantaneous Forward Voltage Drop (Pulsed, T_A = 25 ºC)	I_F = 10Adc I_F = 20Adc I_F = 40Adc	V_{F1} V_{F2} V_{F3}	— — —	0.650 0.715 0.775	0.75 0.80 0.85	V
Instantaneous Forward Voltage Drop (Pulsed, T_A = 125 ºC)	I_F = 10Adc I_F = 20Adc I_F = 40Adc	V_{F4} V_{F5} V_{F6}	— — —	0.500 0.560 0.640	0.64 0.68 0.75	V
Instantaneous Forward Voltage Drop (Pulsed, T_A = -55 ºC)	I_F = 10Adc I_F = 20Adc I_F = 40Adc	V_{F7} V_{F8} V_{F9}	— — —	0.800 0.840 0.925	0.90 0.96 1.03	V
Reverse Leakage Current (Pulsed, T_A = 25 ºC)	V_R = 150 V	IR_1	—	10	500	µA
Reverse Leakage Current (Pulsed, T_A = 125 ºC)	V_R = 150 V	IR_2	—	5	50	mA
Reverse Leakage Current (Pulsed, T_A = 150 ºC)	V_R = 150 V	IR_3	—	10	—	mA
Junction Capacitance (T_A = 25ºC, f = 1MHz)	V_R = 10V	C_J	—	1000	1250	pF

Notes: 1/ For ordering information, price, and availability- Contact factory.
2/ Screening based on MIL-PRF-19500. Screening flows available on request.



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250V MOSFET section: Maximum Ratings		Symbol	Value	Units
Drain - Source Voltage		V_{DSS}	250	V
Gate – Source Voltage	continuous transient	V_{GS}	±20 ±30	V
Max. Continuous Drain Current (package limited)	@ T_C = 25ºC @ T_C = 125ºC	I_{D1} I_{D2}	85 70	A
Pulsed Drain (Instantaneous) Current (Tj limited)	@ T_C = 25ºC	I_{D3}	110	A
Max. Avalanche current	@ L= 0.1 mH	I_{AR}	25	A
Single / Repetitive Avalanche Energy	@ L= 0.1 mH	E_{AS}	1000	mJ
Total Power Dissipation	@ T_C = 25ºC	P_D	250	W
Operating & Storage Temperature		T_{OP} & T_{STG}	-55 to +150	ºC

250V MOSFET section: Electrical Characteristics [4/]		Symbol	Min	Typ	Max	Units
Drain to Source Breakdown Voltage	V_{GS} = 0V, I_D = 250µA	BV_{DSS}	250	—	—	V
Drain to Source On State Resistance	V_{GS} = 10V, I_D = 55A, Tj= 25°C V_{GS} = 10V, I_D = 55A, Tj=125°C	$R_{DS(on)}$	— —	24 45	28 —	mΩ
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 1 mA, Tj= 25°C V_{DS} = V_{GS}, I_D = 1 mA, Tj= -55°C V_{DS} = V_{GS}, I_D = 1 mA, Tj= 125°C	$V_{GS(th)}$	2.5 — —	3.0 4.2 1.5	4.5 — —	V
Gate to Source Leakage	V_{GS} = ±20V, Tj= 25°C V_{GS} = ±20V, Tj= 125°C	I_{GSS}	— —	10 30	±200 —	nA
Zero Gate Voltage Drain Current	V_{DS} = 250V, V_{GS} = 0V, T_j = 25°C V_{DS} = 250V, V_{GS} = 0V, T_j = 125°C	I_{DSS}	— —	0.01 10	5 250	µA µA
Forward Transconductance	V_{DS} = 10V, I_D = 55A, T_j = 25°C	g_{fs}	50	100	—	Mho
Total Gate Charge Gate to Source Charge Gate to Drain Charge	V_{GS} = 10V V_{DS} = 125V I_D = 25A	Q_g Q_{gs} Q_{gd}	— — —	160 40 50	— — —	nC
Turn on Delay Time Rise Time Turn off Delay Time Fall Time	V_{GS} = 15V V_{DS} = 125V I_D = 55A R_G = 2.0Ω, pw= 3us	$t_{d(on)}$ t_r $t_{d(off)}$ t_f	— — — —	20 30 60 30	— — — —	nsec
Diode Forward Voltage	I_F = 55A, V_{GS} = 0V	V_{SD}	—	0.9	1.2	V
Diode Reverse Recovery Time Peak Reverse Recovery Current Reverse Recovery Charge	I_F = 55A, di/dt = 250A/usec	t_{rr} $I_{RM(rec)}$ Q_{rr}	— — —	175 27 2.5	— — —	nsec A µC
Input Capacitance Output Capacitance Reverse Transfer Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1 MHz	C_{iss} C_{oss} C_{rss}	— — —	9400 850 60	— — —	pF

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CASE OUTLINE: ASPM