Prisemi®

PSMTO85V120

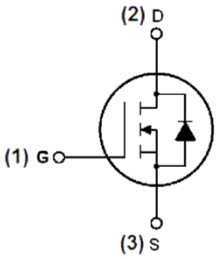
N-Channel MOSFET

Description

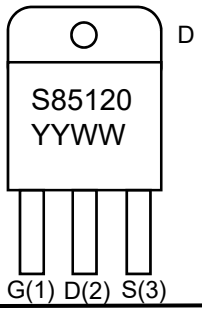
The PSMTO85V120 uses split gate trench technology to provide excellent $R_{DS(ON)}$ low gate charge. This device is suitable for power management and high efficiency applications at high switching frequencies applications.

MOSFET Product Summary		
V_{DS}(V)	$R_{DS(on)}$(mΩ)	I_D(A)
85	4.7@ V_{GS} = 10V	120

TO-220 (Top View)



Schematic diagram



Marking (Top View)

Feature

- Low $R_{DS(ON)}$ - Ensures On-State Losses are Minimized
- Excellent Q_{gd} x $R_{DS(ON)}$ Product(FOM)
- Advanced Technology for DC-DC Converts
- Small Form Factor Thermally Efficient Package Enables Higher Density End Products
- 100% UIS (Avalanche) Rated
- Lead-Free Finish ; RoHS Compliant
- Halogen and Antimony Free. "Green" Device

Applications

- PWM applications
- Load switch
- Power management
- DC-DC Converters
- Wireless Chargers

Absolute maximum rating@25℃

Rating	Symbol	Value	Units
Drain-Source Voltage	V_{DS}	85	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	120	A
Pulsed Drain Current[1)]	I_{DM}	480	A
Total Power Dissipation[2)]	P_D	174	W
Thermal Resistance , Junction-case	$R_{\theta JC}$	0.72	℃/W
Thermal Resistance Junction-to-Ambient @ Steady State[2)]	$R_{\theta JA}$	51.3	℃/W
Junction and Storage Temperature Range	T_J,T_{STG}	-55~+150	℃

Electrical characteristics per line@25℃ (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V,I_D = 250μA	85	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 85V,V_{GS} = 0V	-	-	1.0	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±20V,V_{DS} = 0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS},I_D = 250μA	2.0	2.8	4.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS} = 10V,I_D = 30A	-	4.7	5.5	mΩ
Dynamic Characteristics[4)]						
Input Capacitance	C_{lss}	V_{DS} = 40V,V_{GS} = 0V, f = 1.0MHz	-	4100	-	pF
Output Capacitance	C_{oss}		-	640	-	pF
Reverse Transfer Capacitance	C_{rss}		-	10	-	pF
Switching Characteristics[4)]						
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 40V, V_{GEN} = 10V, R_{GEN} = 3Ω,I_D = 50A	-	8.0	-	ns
Turn-on Rise Time	t_r		-	38	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	30	-	ns
Turn-Off Fall Time	t_f		-	15	-	ns
Total Gate Charge	Q_g	V_{DS} = 40V,I_D = 50A, V_{GS} = 10V	-	50	-	nC
Gate-Source Charge	Q_{gs}		-	18	-	nC
Gate-Drain Charge	Q_{gd}		-	6.0	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage[3)]	V_{SD}	V_{GS} = 0V,I_S = 30A	-	0.8	1.3	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper in a still air environment with T_a = 25℃.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Typical Characteristics

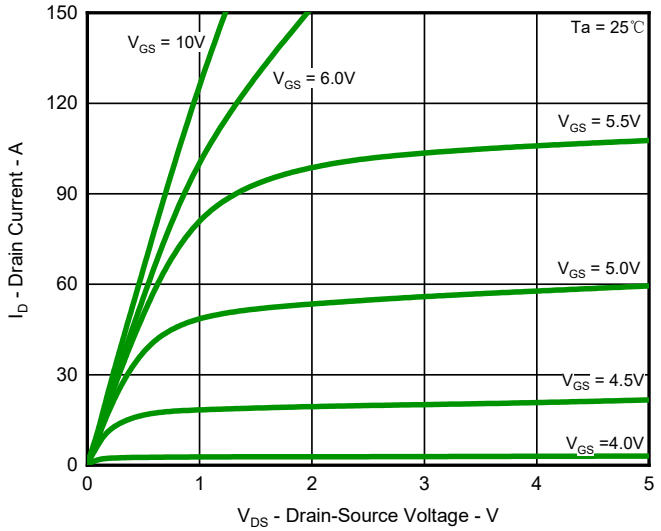


Fig.1 Output Characteristics

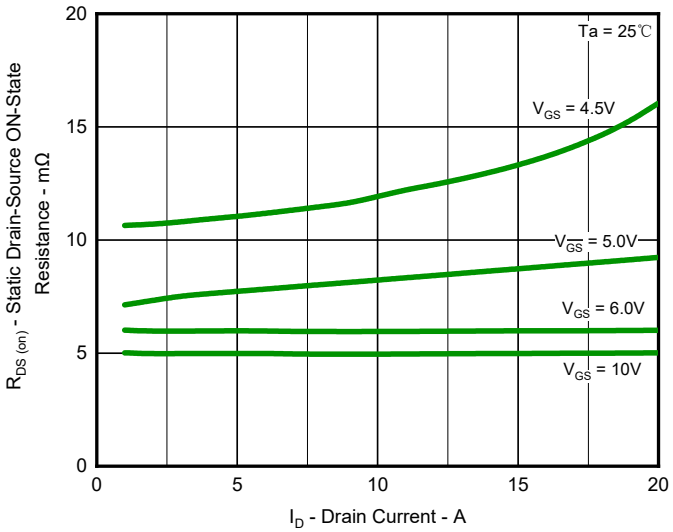


Fig.2 On-Resistance vs. Drain Current (I)

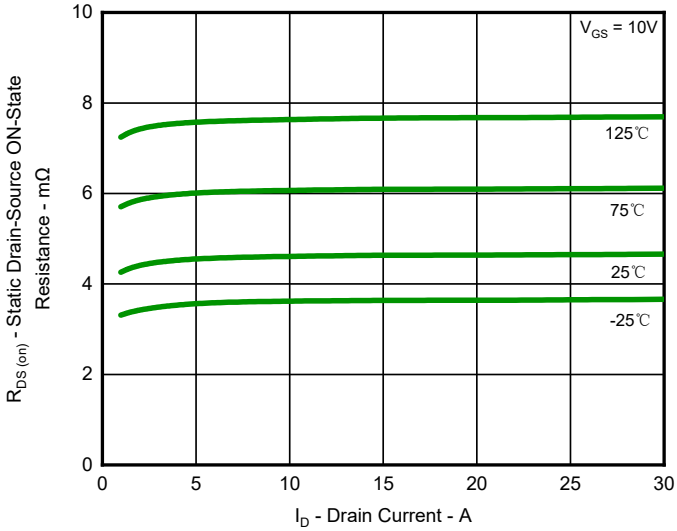


Fig.3 On-Resistance vs. Drain Current (II)

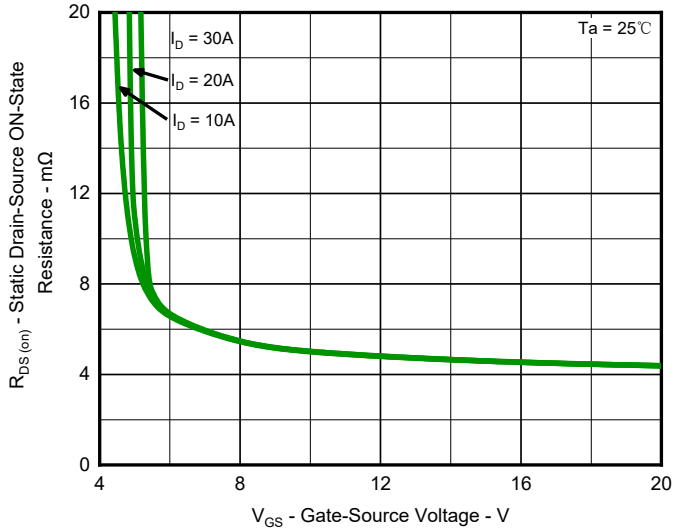


Fig.4 On-Resistance vs. Gate-Source Voltage

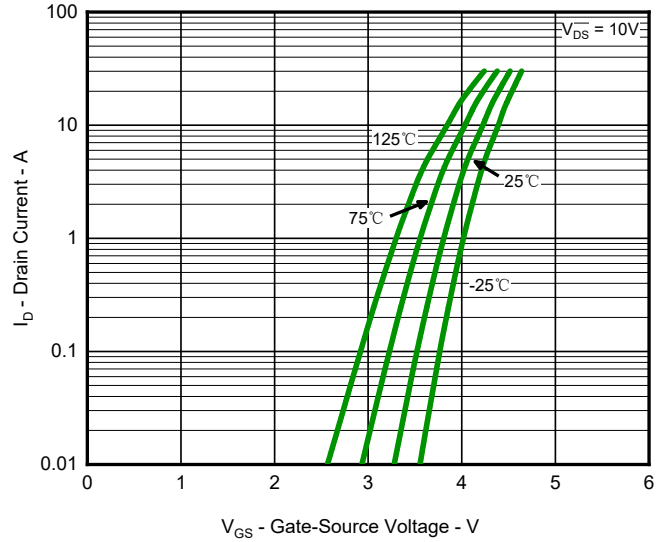


Fig.5 Typical Transfer Characteristic

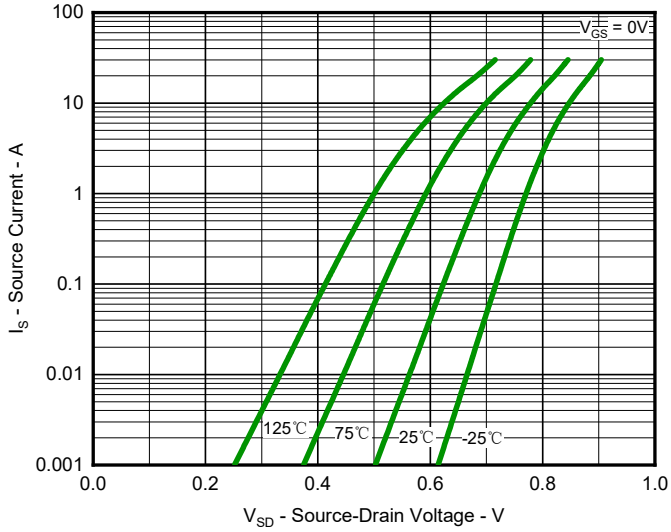


Fig.6 Diode Forward Voltage vs. Current

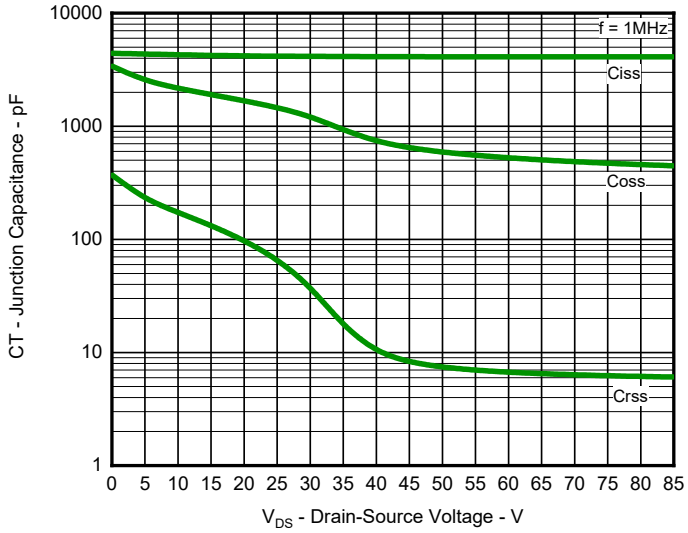


Fig.7 Typical Junction Capacitance

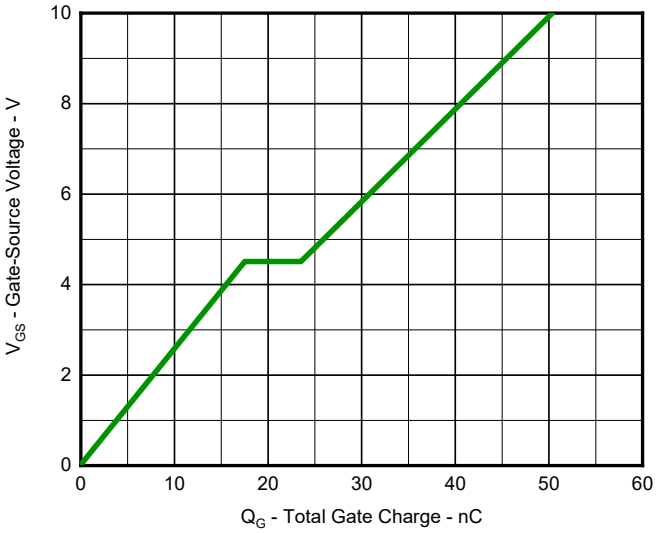


Fig.8 Gate Charge Characteristics

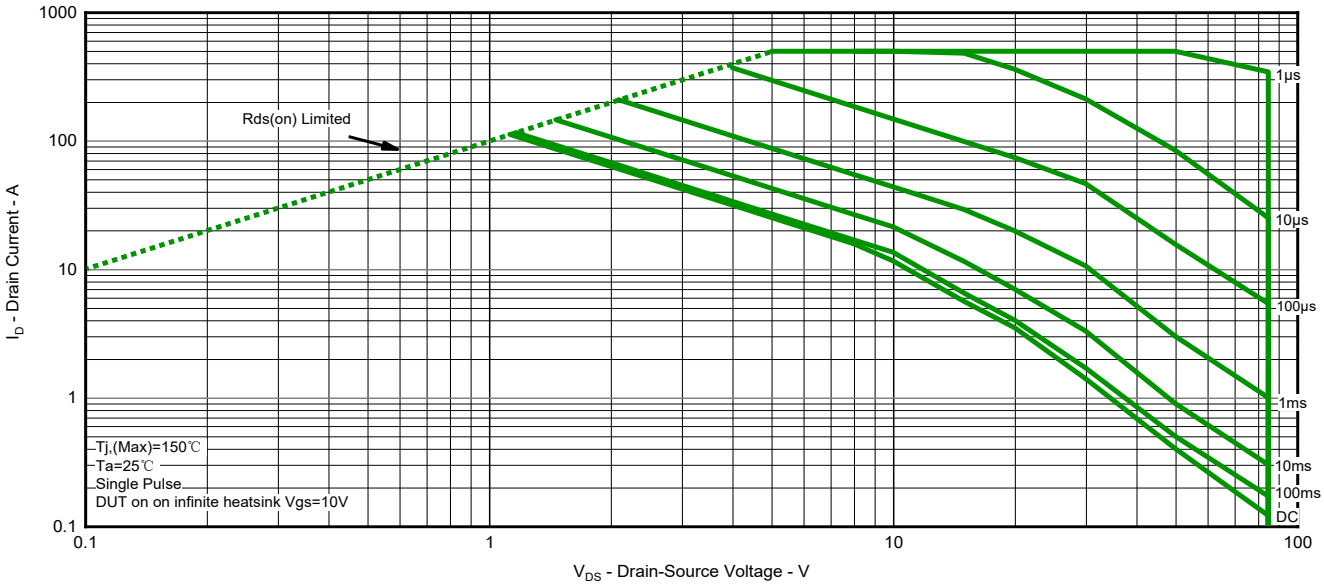


Fig.9 Safe Operation Area

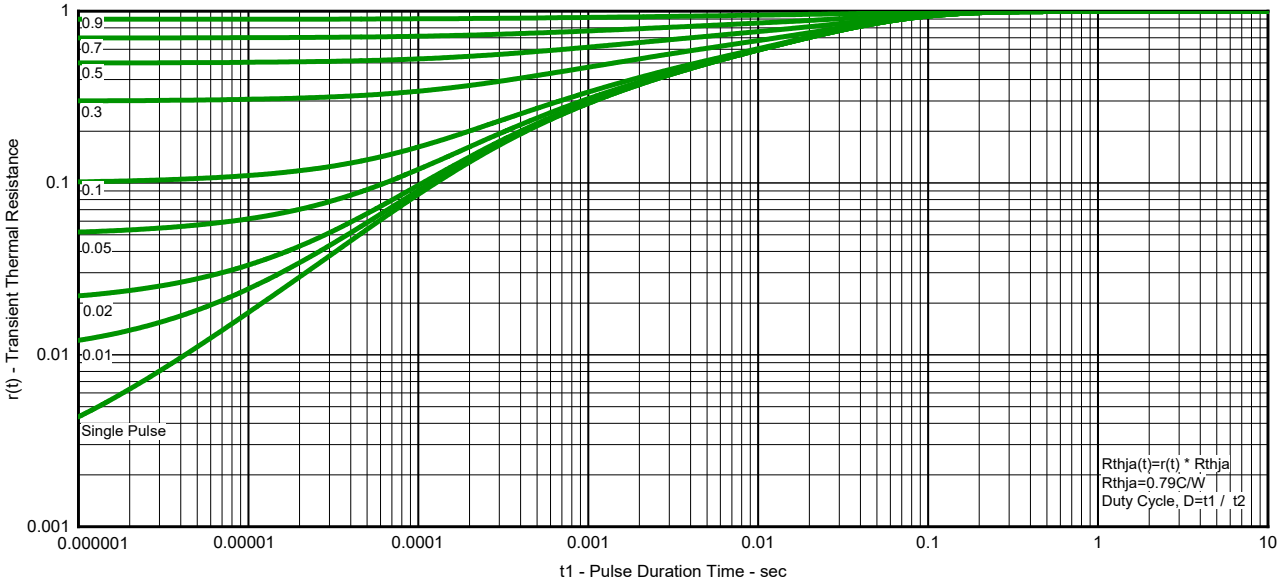
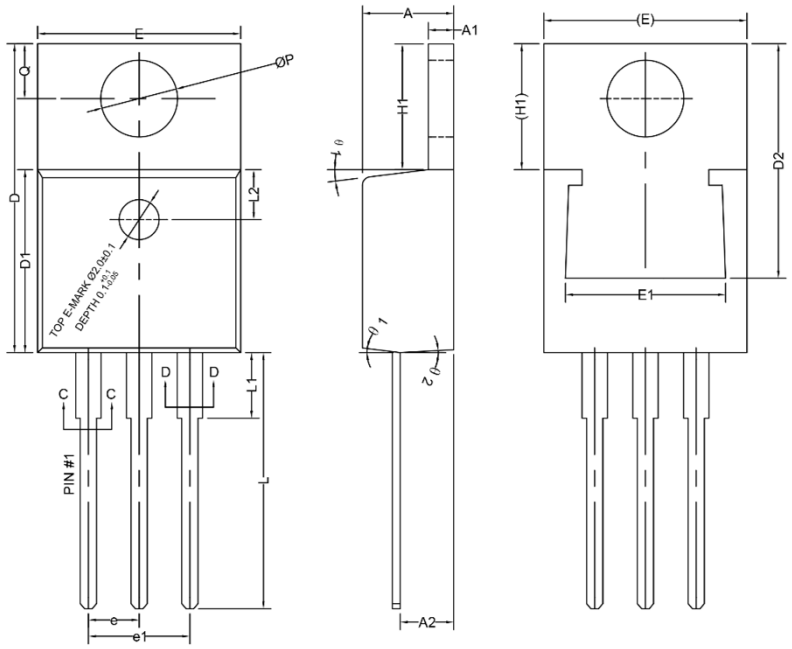


Fig.10 Transient Thermal Resistance

Product dimension (TO-220)



Dim	Millimeters		Inches	
	Min	Max	Min	Max
A	4.40	4.70	0.173	0.185
A1	1.22	1.32	0.048	0.052
A2	2.59	2.79	0.102	0.110
D	15.15	15.75	0.596	0.620
D1	9.05	9.25	0.356	0.364
D2	11.40	12.88	0.449	0.507
E	9.96	10.36	0.392	0.408
E1	6.86	8.89	0.270	0.350
e	2.44	2.64	0.096	0.104
e1	4.98	5.18	0.196	0.204
H1	6.10	6.50	0.240	0.256
L	12.70	13.12	0.500	0.517
L1	-	3.90	-	0.154
L2	2.50 Ref.		0.098 Ref.	
φP	3.80	3.88	0.150	0.153
Q	2.60	2.90	0.102	0.114
θ1	5°	9°	5°	9°
θ2	1°	3°	1°	3°

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