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TPM2P106PS8

P-CHANNEL ENHANCEMENT MODE MOSFET
WITH INTEGRATED SCHOTTKY DIODE

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GENERAL FEATURES

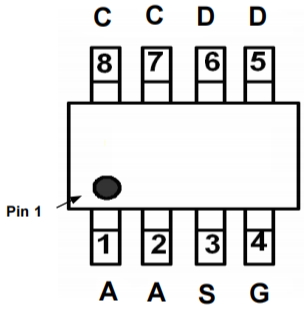
MOSFET		
$V_{(BR)DSS}$	$R_{DS(on)\ max}$	I_D
-60V	110mΩ @ V_{GS} = -10V	-3.3A
	130mΩ @ V_{GS} = -4.5V	-2.8A
SCHOTTKY DIODE		
V_R	$V_{F\ max}$	I_O
45V	450mV @ I_F = 1A	2.0A
	600mV @ I_F = 2A	

Application

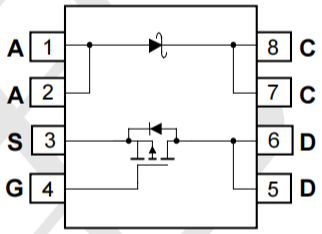
- DC-DC Converters
- Power Management Functions
- Backlighting

Package and Pin Configuration

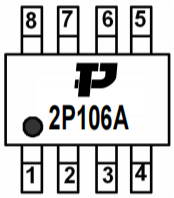
SOP-8 top view



Circuit diagram



Marking:



Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	-60	V
Gate-Source Voltage			V_{GSS}	±20	V
Drain Current (Note 6) V_{GS} = -10V	t < 10s	T_A = +25°C T_A = +70°C	I_D	-4.5 -3.6	A
Maximum Body Diode Forward Current (Note 6)			I_S	-2.1	A
Pulsed Drain Current (10μs pulse, duty cycle = 1%)			I_{DM}	-19	A
Avalanche Current (Notes 7) L = 0.1mH			I_{AS}	-17.6	A
Avalanche Energy (Notes 7) L = 0.1mH			E_{AS}	15.4	mJ

Thermal Characteristic

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)		P_D	1.5	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	80	°C/W
	t<10s		48	°C/W
Total Power Dissipation (Note 6)		P_D	2.0	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	61	°C/W
	t<10s		37	°C/W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	6.4	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Electrical Characteristics (T_A=25℃unless otherwise noted)

P-Channel Mosfet

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	-60	—	—	V	V_{GS} = 0V, I_D = -250μA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-1	μA	V_{DS} = -48V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	100	nA	V_{GS} = ±16V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(th)}$	-1	-1 .7	-3	V	V_{DS} = V_{GS}, I_D = -250μA
Static Drain-Source On-Resistance	$R_{DS\ (ON)}$	—	86	110	mΩ	V_{GS} = -10V, I_D = -3A
		—	98	130		V_{GS} = -4.5V, I_D =-2.5A
Diode Forward Voltage	V_{SD}	—	-0.7	-1.2	V	V_{GS} = 0V, I_S = -1A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	1030	—	pF	V_{DS} = -30V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	49.1	—		
Reverse Transfer Capacitance	C_{rss}	—	38.7	—		
Gate Resistance	R_G	—	13.6	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge (V_{GS} = -4.5V)	Q_g	—	9.5	—	nC	V_{DS} = -30V, I_D = -5A
Total Gate Charge (V_{GS} = -10V)	Q_g	—	19.4	—		
Gate-Source Charge	Q_{gs}	—	2.3	—		
Gate-Drain Charge	Q_{gd}	—	3.6	—		
Turn-On Delay Time	$t_{D(on)}$	—	3.7	—	ns	V_{GS} = -10V, V_{DS} = -30V, R_{GEN} = 6Ω, I_D = -5A
Turn-On Rise Time	t_r	—	6.3	—		
Turn-Off Delay Time	$t_{D(off)}$	—	58.7	—		
Turn-Off Fall Time	t_f	—	26.1	—		
Body Diode Reverse Recovery Time	t_{rr}	—	14.85	—	ns	I_S = -5A, dI/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q_{rr}	—	8.8	—	nC	I_S = -5A, dI/dt = 100A/μs

Electrical Characteristics (T_A=25℃unless otherwise noted)

Schottky Diode

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 8)	$V_{(BR)R}$	45		—	V	I_R = 1mA
Forward Voltage (Note 8)	V_F	— —	— 0.48	0.45 0.6	V	I_F = 1A I_F = 2A
Reverse Current (Note 8)	I_R	—	30	80	μA	V_R = 45V

Typical Electrical and Thermal Characteristics

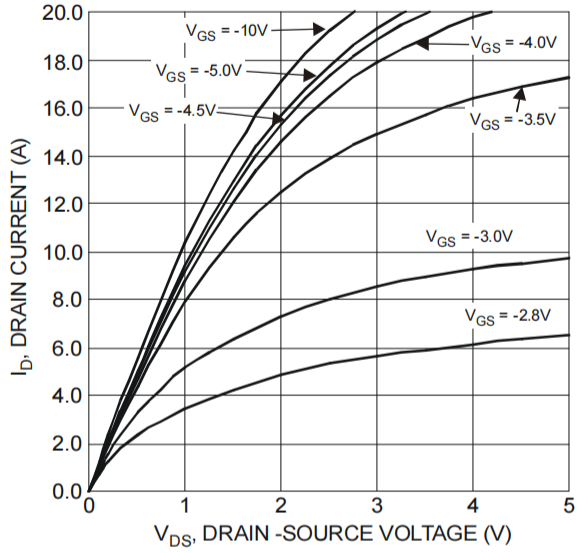


Figure 1 Typical Output Characteristics

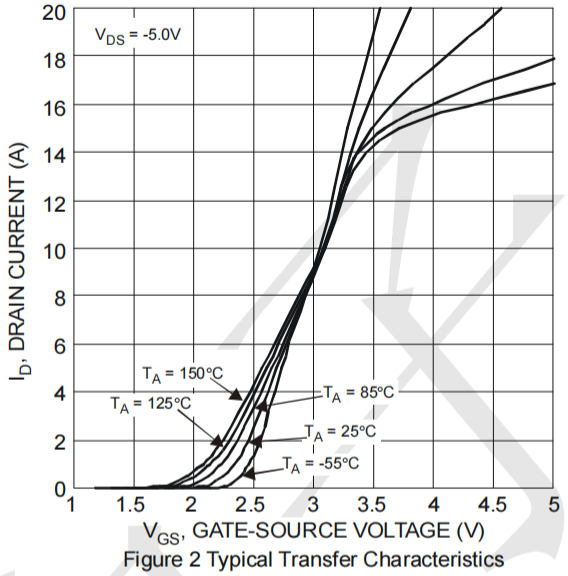


Figure 2 Typical Transfer Characteristics

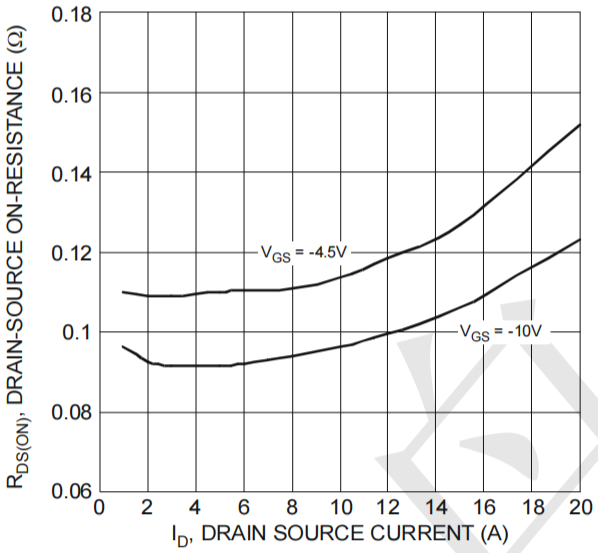


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

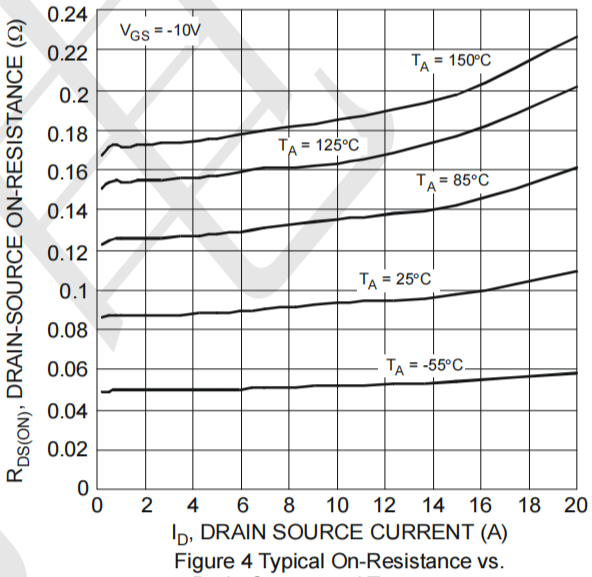


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

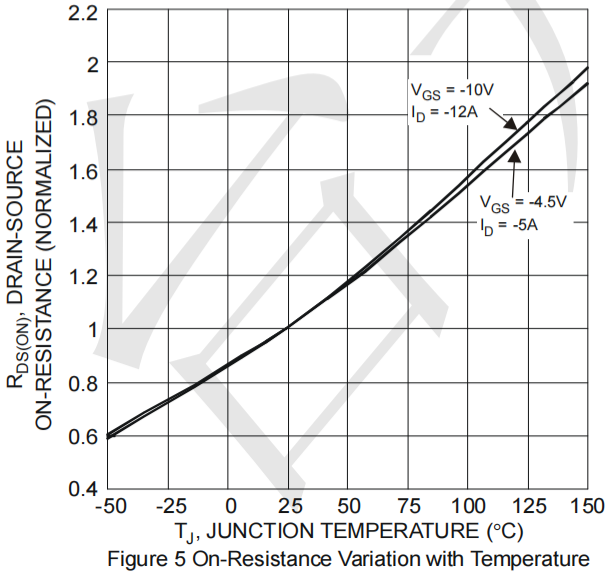


Figure 5 On-Resistance Variation with Temperature

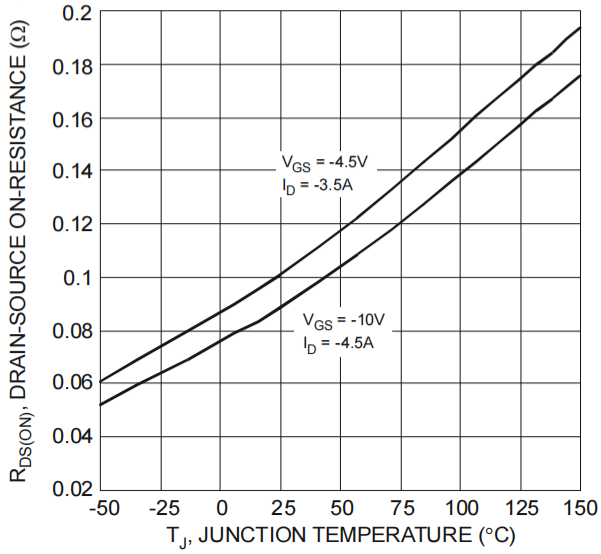


Figure 6 On-Resistance Variation with Temperature

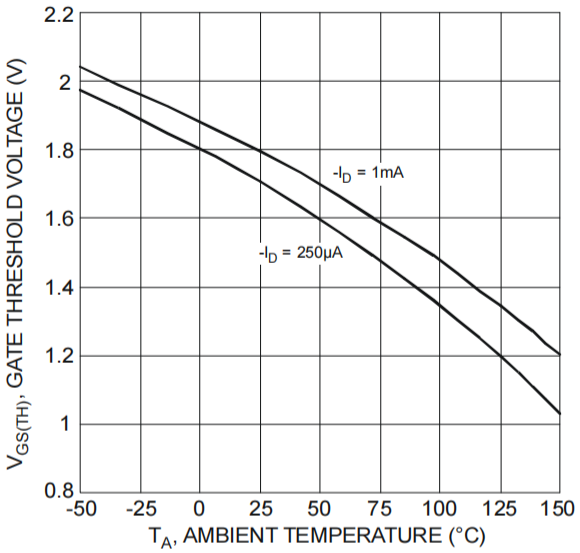


Figure 7 Gate Threshold Variation vs. Ambient Temperature

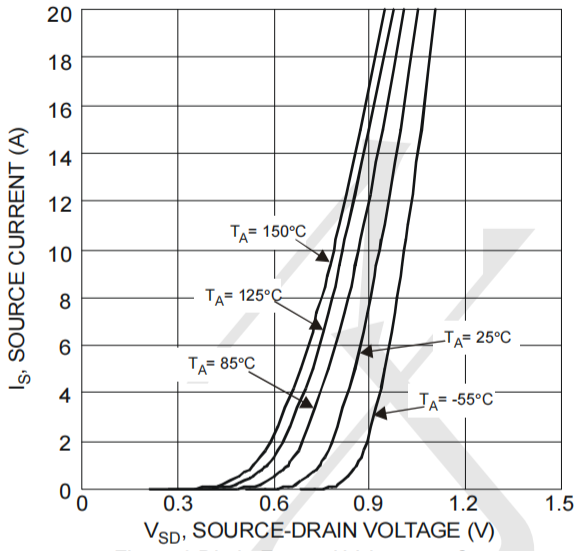


Figure 8 Diode Forward Voltage vs. Current

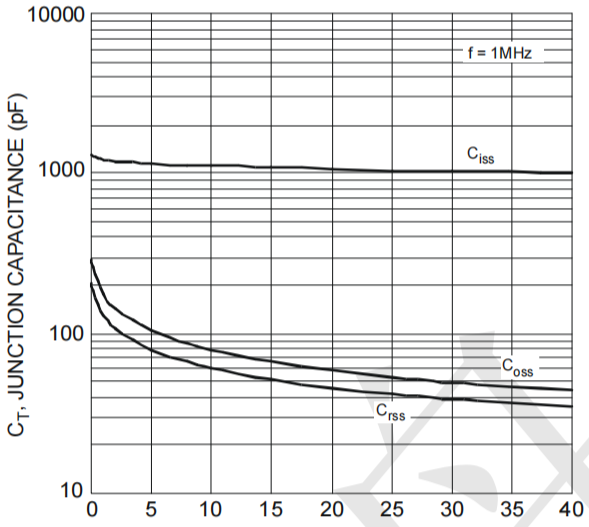


Figure 9 ypical Junction Capacitance

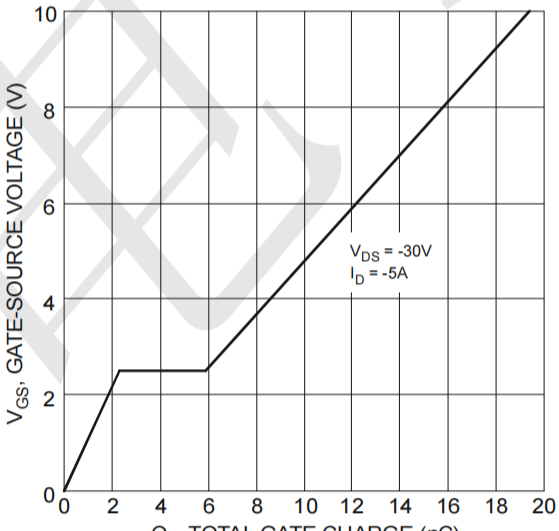


Figure 10 Gate-Charge Characteristics

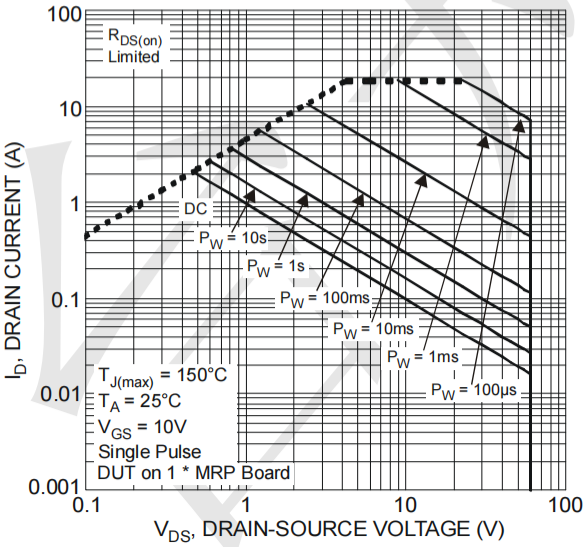


Figure 11 SOA, Safe Operation Area

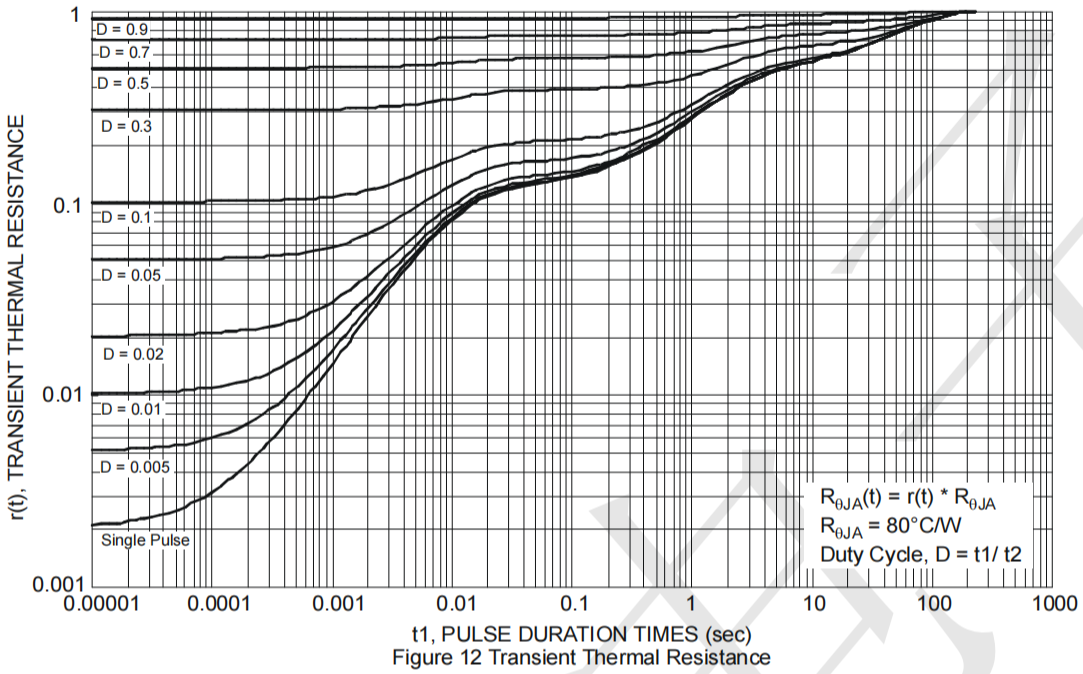
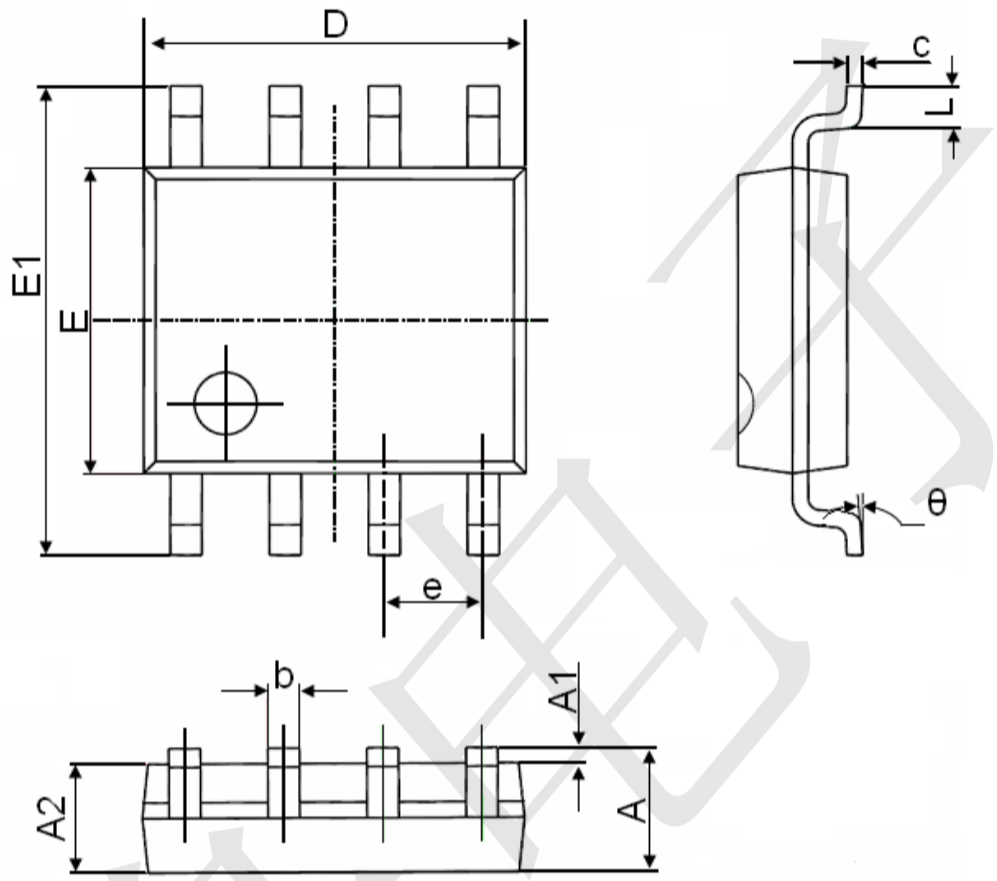


Figure 12 Transient Thermal Resistance

SOP-8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°