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TPM100VAND56

100V N-Channel MOSFET

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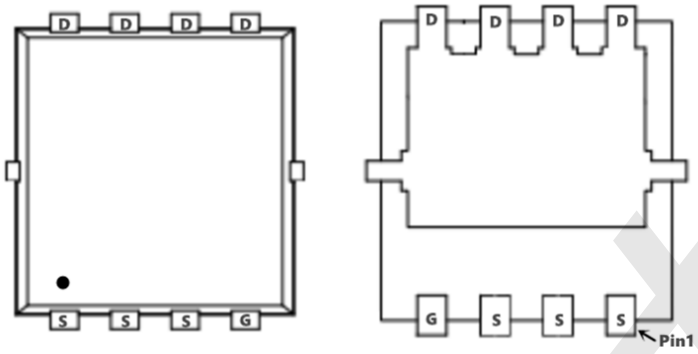
Product Summary

- V_{DS} = 100V I_D = 105 A
- $R_{DS(ON)}$ < 5.5 mΩ @ V_{GS}=10V
- $R_{DS(ON)}$ < 8 mΩ @ V_{GS}=4.5V

Application

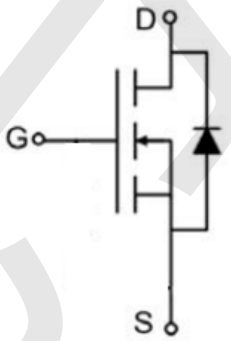
- Load/Power switch
- Interfacing, logic switching
- Battery management for ultra protable electronics

Package and Pin Configuration



DFN5*6-8L

Circuit diagram



Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Symbol	Parameter		N-Channel	Unit
V_{DSS}	Drain-Source Voltage		100	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_{DM}①	Pulse Drain Current Tested	T_C=25°C	142	A
I_D	Continuous Drain Current	T_C=25°C	105	A
		T_C=100°C	65	
P_D	Maximum Power Dissipation	T_C=25°C	89	W
		T_C=100°C	36	
I_{AS}②	Avalanche Current, Single pulse	L=0.1mH	38	A
E_{AS}②	Avalanche Energy, Single pulse	L=0.1mH	72	mJ

Electrical Characteristics (T =25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250uA	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=80V, V_{GS}=0V	-	-	1	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250uA	1	2	3	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$④	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=20A	-	4.5	5.5	mΩ
		V_{GS}=4.5V, I_{DS}=10A	-	6.5	8.5	
gfs	Forward Transconductance	V_{DS}=5V, I_{DS}=10A	-	30.2	-	S
Dynamic Characteristics ⑤						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V, Freq.=1MHz	-	0.5	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=50V, Freq.=1MHz	-	3358	-	pF
C_{oss}	Output Capacitance		-	924	-	
C_{rss}	Reverse Transfer Capacitance		-	42	-	
$td_{(ON)}$	Turn-on Delay Time	V_{GS}=10V,V_{DS}=25V, I_D=1A,R_{GEN}=3Ω	-	13.3	-	nS
t_r	Turn-on Rise Time		-	4.2	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	2.9	-	
t_f	Turn-off Fall Time		-	101.4	-	
Q_g	Total Gate Charge	V_{GS}=4.5V,V_{DS}=50V I_D=20A	-	32.9	-	nC
Q_g	Total Gate Charge	V_{GS}=10V,V_{DS}=50V, I_D=20A	-	64.3	-	
Q_{gs}	Gate-Source Charge		-	15.2	-	
Q_{gd}	Gate-Drain Charge		-	14.6	-	
Source-Drain Characteristics						
V_{SD}④	Diode Forward Voltage	I_{SD}=10A, V_{GS}=0V	-	0.8	1.1	V
t_{rr}	Reverse Recovery Time	I_F=20A, V_R=50V dI$_F$/dt=100A/μs	-	47.7	-	nS
Q_{rr}	Reverse Recovery Charge		-	59.4	-	nC

Typical Electrical and Thermal Characteristic Curves

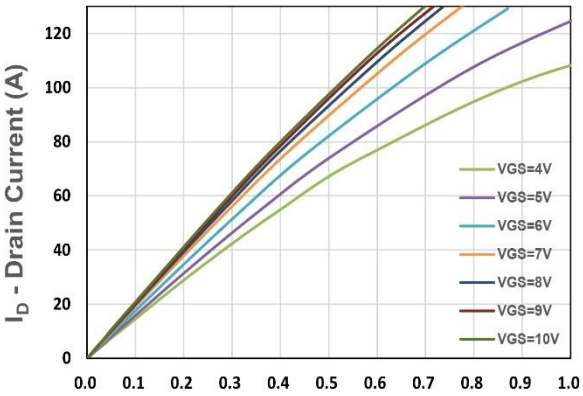


Figure 1. Output Characteristics

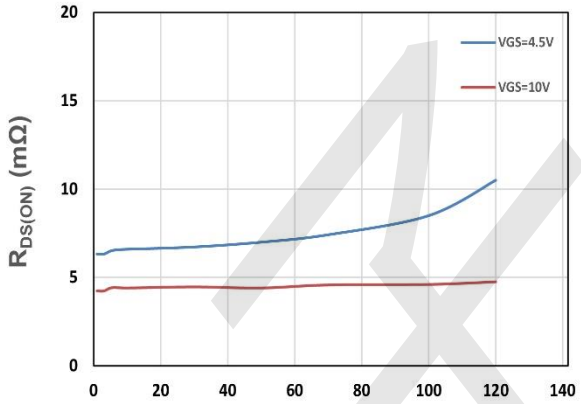


Figure 2. On-Resistance vs. ID

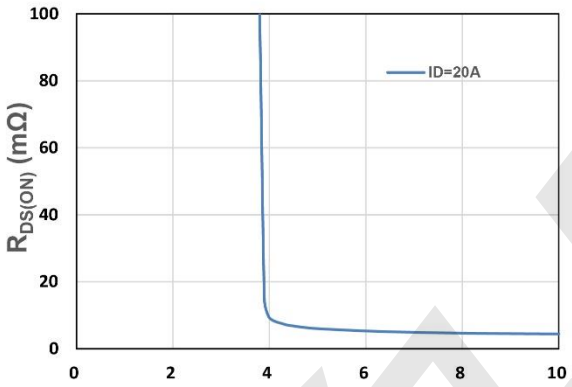


Figure 3. On-Resistance vs. VGS

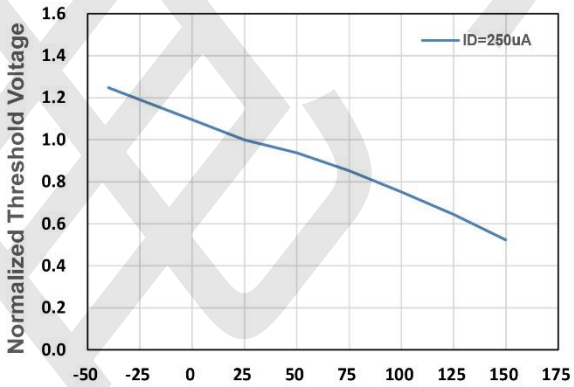


Figure 4. Gate Threshold Voltage

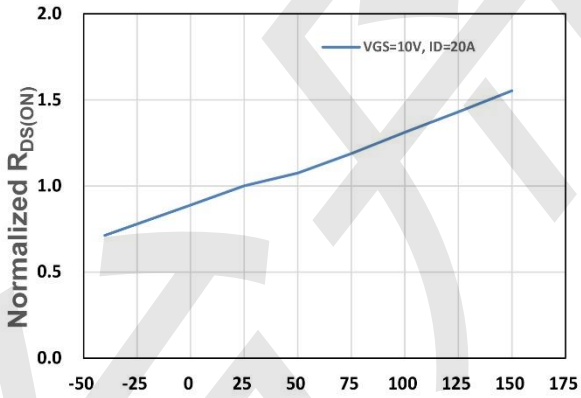


Figure 5. Drain-Source On Resistance

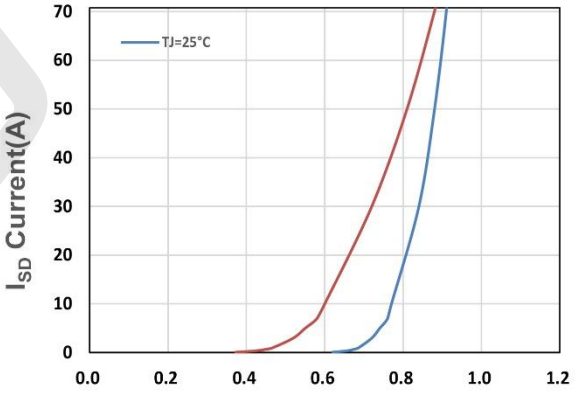


Figure 6. Source-Drain Diode Forward

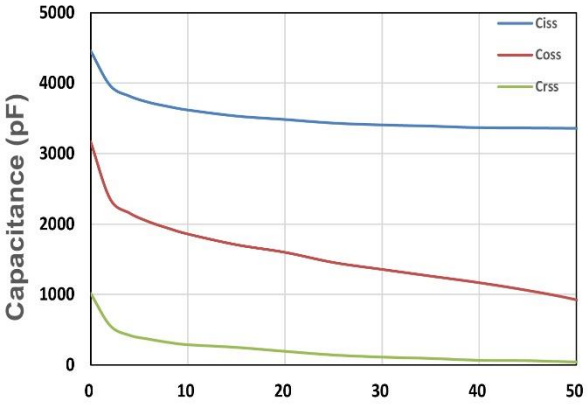


Figure 7. Capacitance

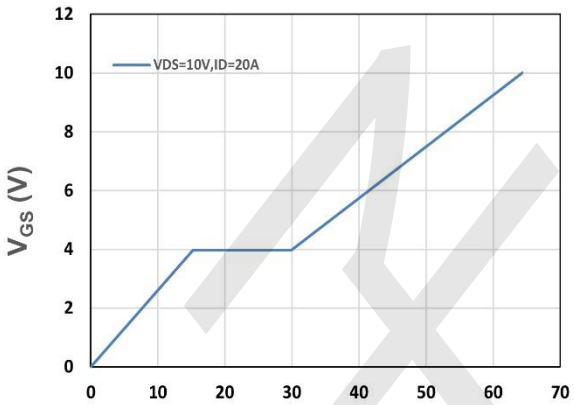


Figure 8. Gate Charge Characteristics

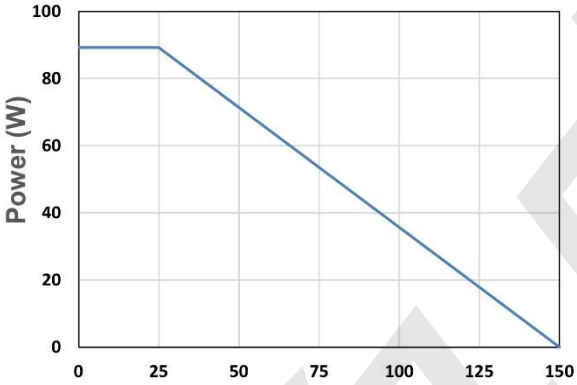


Figure 9. Power Dissipation

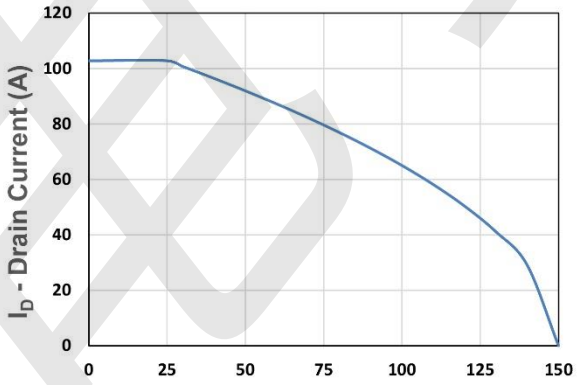


Figure 10. Drain Current

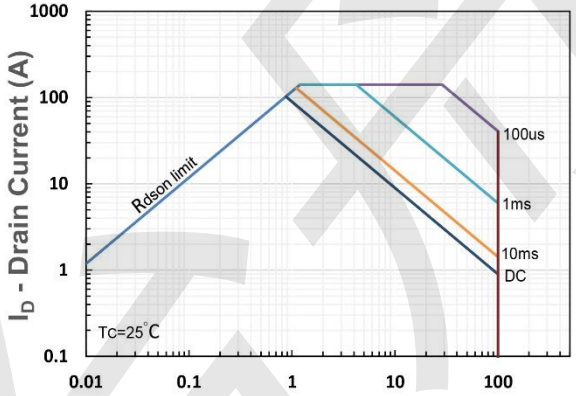


Figure 11. Safe Operating Area

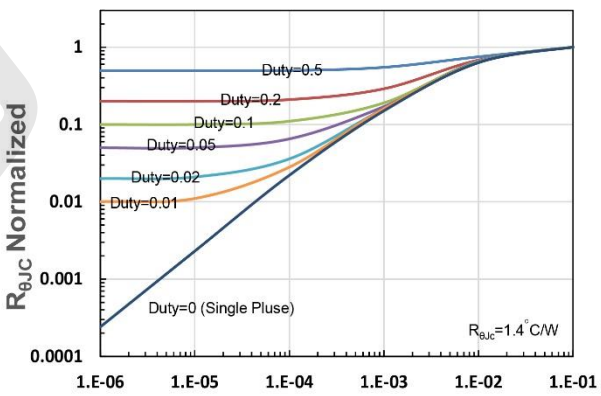
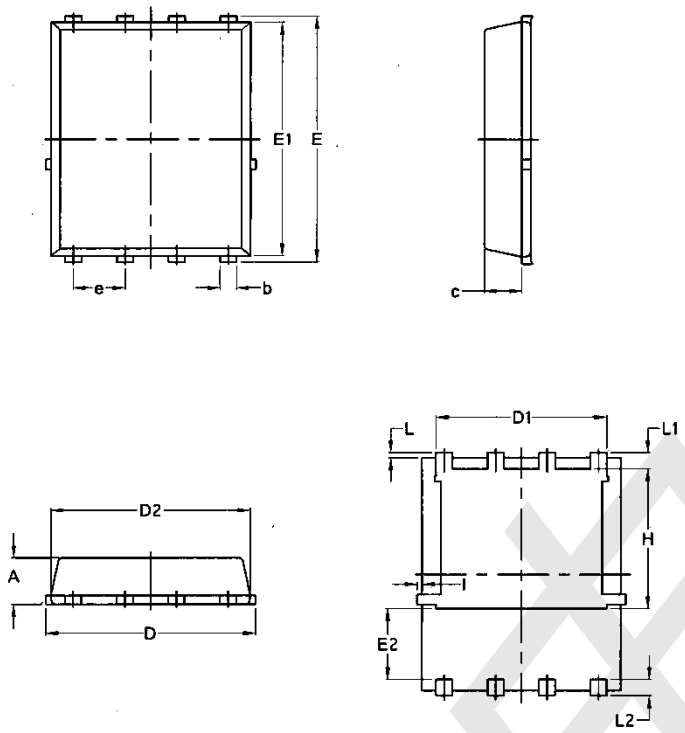


Figure 12. RθJC Transient Thermal Impedance

Package Outline Dimensions DFN5*6-8L



Symbol	Common			
	mm		Inch	
	Mim	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070