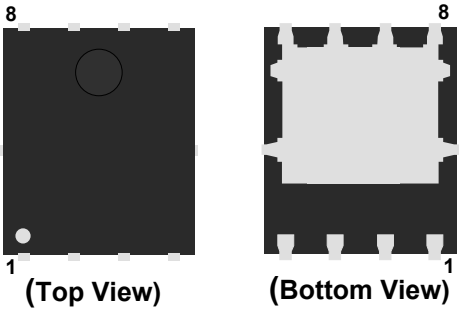
TNG40N60DN

N-Channel Enhancement Mode Power MOSFET

Product Summary

- V_{DS}= 60V,I_D= 40A
- $R_{DS(on)}$=15mΩ @V_{GS}= 10V
- $R_{DS(on)}$= 20mΩ @V_{GS}= 4.5V

PDFN5x6-8L



Features

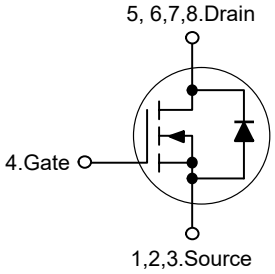
- Advanced Split Gate Trench Technology
- 100% Avalanche Tested
- RoHS Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 3

Pin	Description
1,2,3	Source
4	Gate
5,6,7,8	Drain

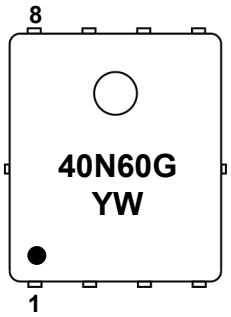
Application

- Switching application
- Li-battery protection
- Uninterruptible Power supply

Schematic Diagram



Marking Code



Absolute Maximum Ratings

Ratings at 25℃ case temperature unless otherwise specified.

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Continuous Drain Current	T_C = 25ºC	I_D	40	A
	T_C = 100ºC		25	
Pulsed Drain Current (note1)		I_{DM}	160	A
Gate-Source Voltage		V_{GS}	±20	V
Power Dissipation		P_D	62	W
Single pulse avalanche energy （note2）		E_{AS}	56	mJ
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 To 150	ºC

Thermal Characteristics

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2	°C/W

Electrical Characteristics

(T_J=25℃ unless otherwise specified)

Specifications T_J = 25ºC, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Value**			**Unit**
			Min.	**Typ.**	**Max.**	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60V, V_{GS} = 0V	--	--	1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.4	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 14A	--	9	14	mΩ
		V_{GS} = 4.5V, I_D = 10A	--	12	18	
Forward Transconductance	g_{FS}	V_{GS} = 5V, I_D = 14A	--	24	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 30V, f = 1.0MHz	--	1050	--	pF
Output Capacitance	C_{oss}		--	300	--	
Reverse Transfer Capacitance	C_{rss}		--	25	--	
Total Gate Charge	Q_g	V_{DD} = 30V, I_D = 14A, V_{GS} = 10V	--	22	--	nC
Gate-Source Charge	Q_{gs}		--	3	--	
Gate-Drain Charge	Q_{gd}		--	5	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 30V, I_D = 14A, R_G = 10Ω	--	9	--	ns
Turn-on Rise Time	t_r		--	4	--	
Turn-off Delay Time	$t_{d(off)}$		--	29	--	
Turn-off Fall Time	t_f		--	4	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	40	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 14A, V_{GS} = 0V	--	--	1.2	V
Reverse Recovery Charge	Qrr	I_F = 14A, V_{GS} = 0V di/dt=500A/us	--	65	--	nC
Reverse Recovery Time	Trr		--	19	--	ns

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. EAS condition : Tj=25℃ ,VDD=50V,VGS=10V,L=0.5mH,Rg=25Ω
   The table shows the minimum avalanche energy, which is 156mJ when the device is tested until failure
3. Identical low side and high side switch with identical R_G

Typical Characteristic Curves

Figure 1. Output Characteristics

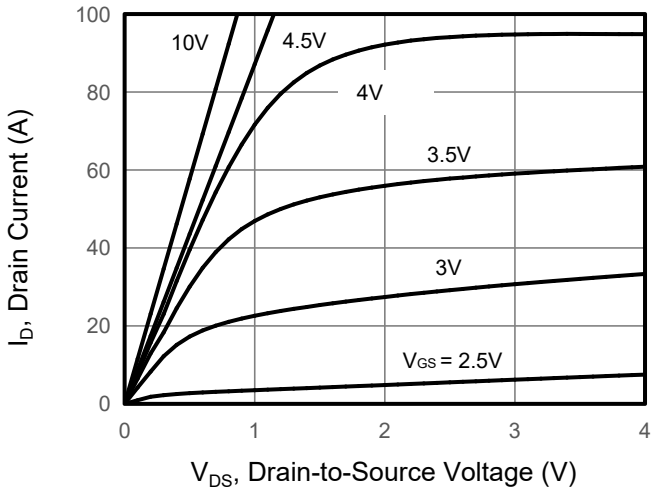


Figure 2. Transfer Characteristics

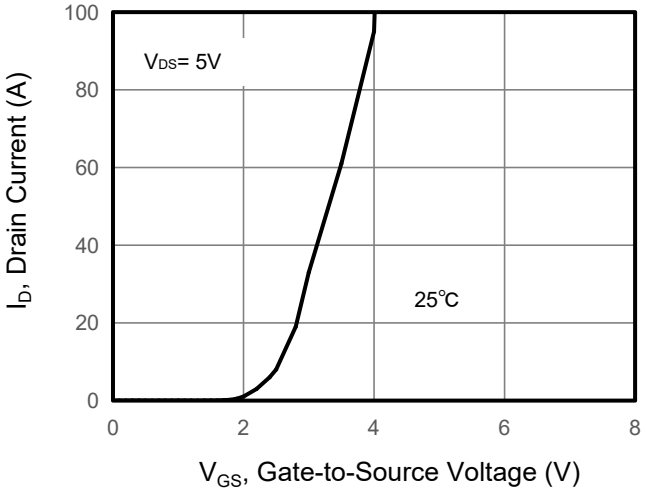


Figure 3. Drain Source On Resistance

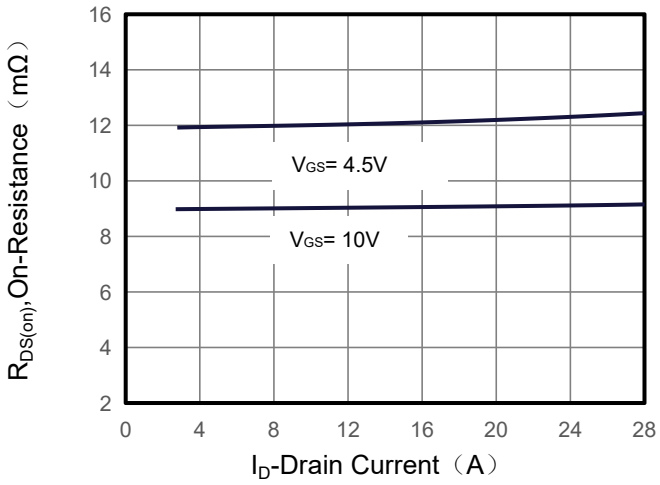


Figure 4. Gate Charge

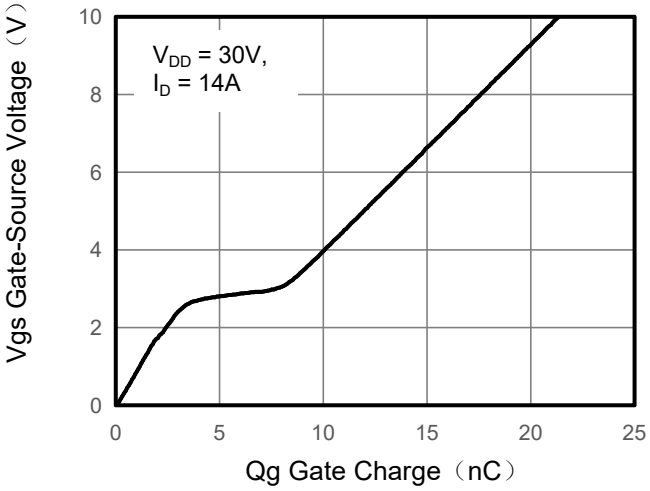


Figure 5. Capacitance

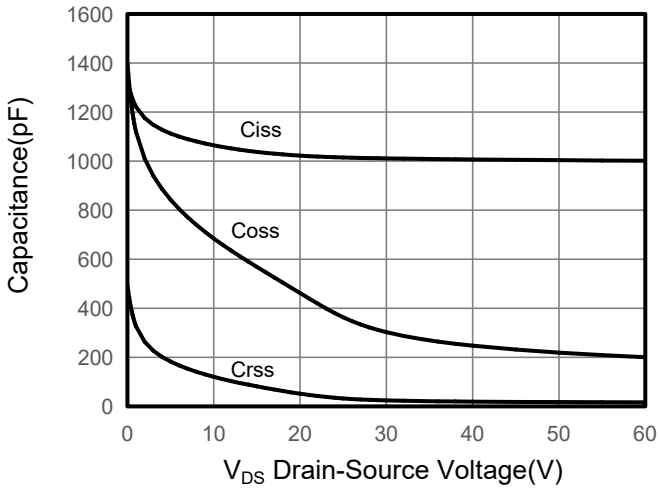


Figure 6. Source-Drain Diode Forward

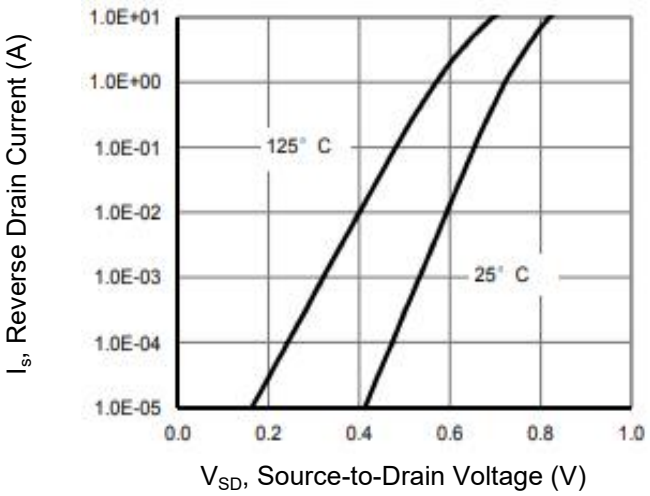


Figure 7. Drain-Source On-Resistance

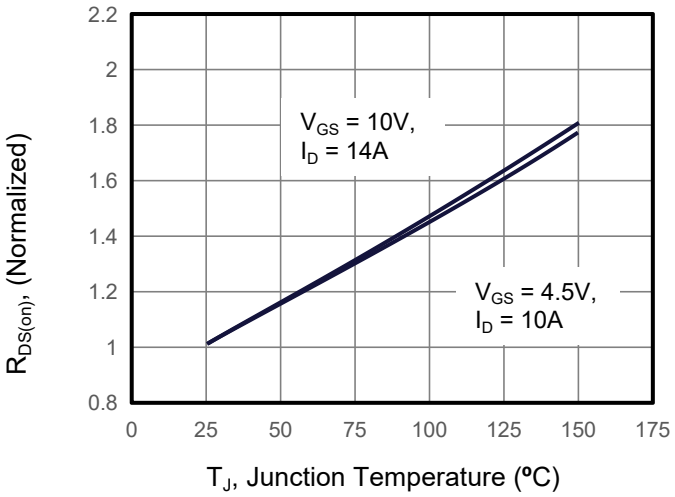


Figure 8. Safe Operation Area

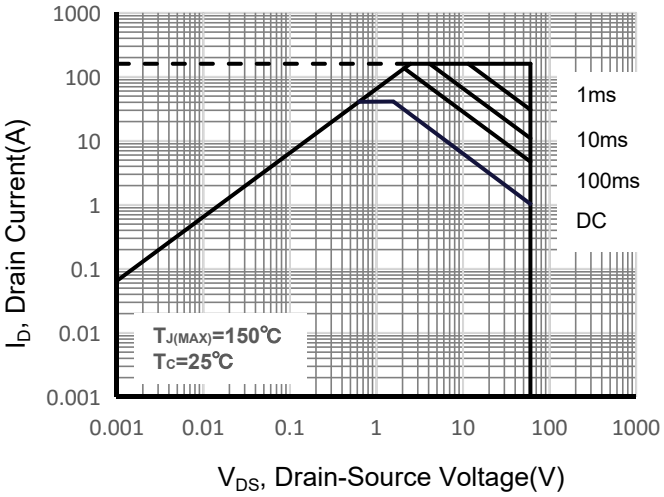


Figure 9. Maximum Continuous Drain Current vs Case Temperature

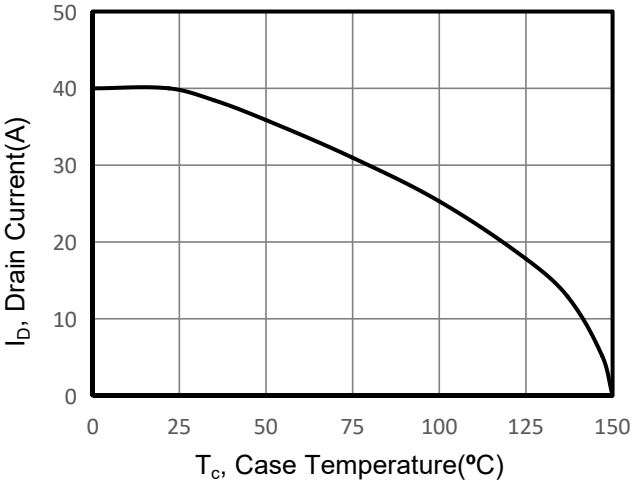
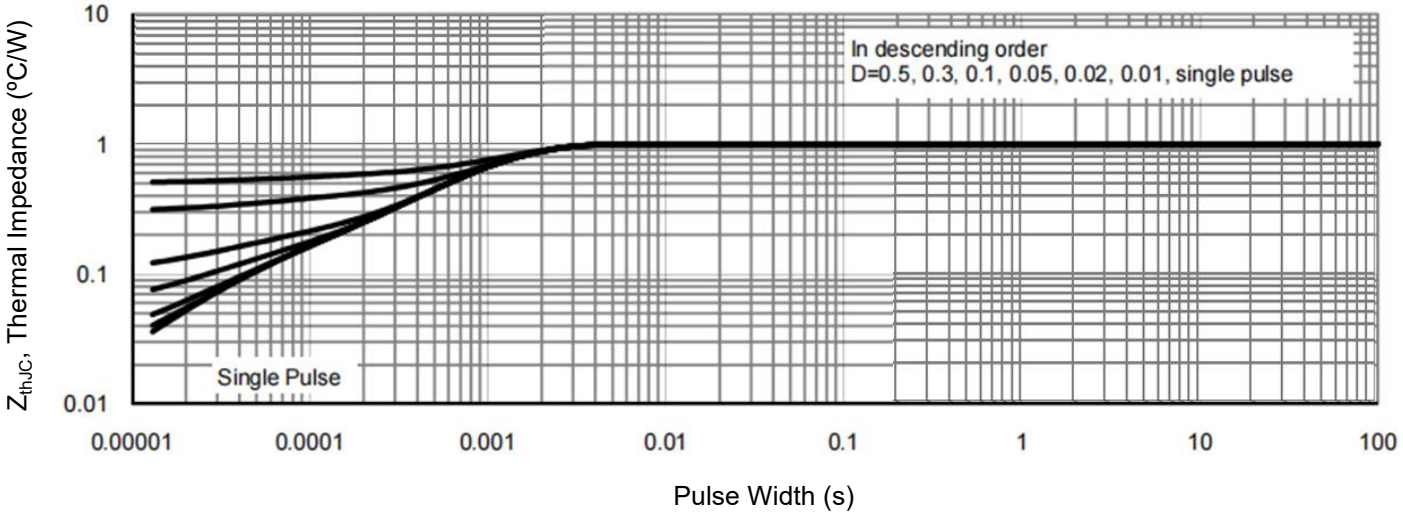
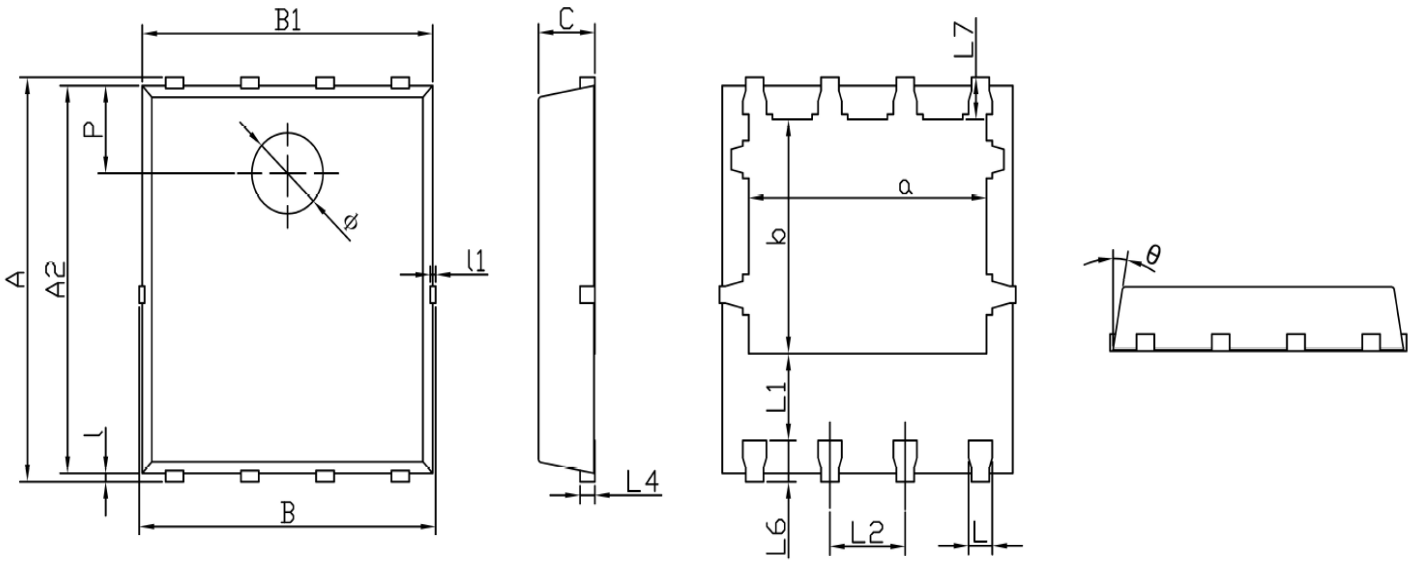


Figure 10. Normalized Maximum Transient Thermal Impedance



Package Outline

PDFN5x6-8L Dimensions in mm



Symbol	Dimensions		Symbol	Dimensions	
	Min.	Max.		Min.	Max.
A	5.90	6.10	L1	1.10	-
a	3.91	4.11	l1	-	0.10
A2	5.70	5.80	L2	1.17	1.37
B	4.90	5.10	L4	0.21	0.34
b	3.375	3.575	L6	0.51	0.71
B1	4.80	5.00	L7	0.51	0.71
C	0.90	1.00	P	1.15	1.45
L	0.30	0.50	θ	8°	12°
l	0.06	0.20	Φ	1.10	1.30

Contact Information

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For additional information, please contact your local Sales Representative.

