





Power MOSFETS

DATASHEET

LM60025NHV2A

N-Channel
Enhancement Mode MOSFET

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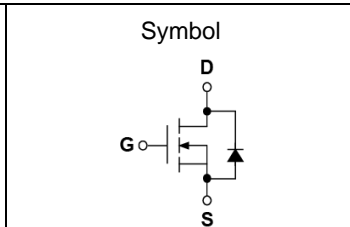
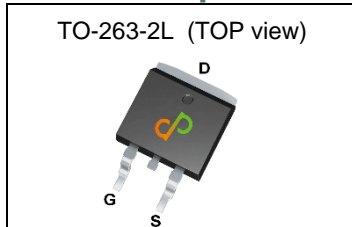


Quality Management Systems

ISO 9001:2015 Certificate

N-Channel Enhancement Mode MOSFET

Pin Description



Product Summary

Symbol	N-Channel	Unit
V_{DSS}	60	V
$R_{DS(ON)-Max}$	3.3	m Ω
I_D	187	A

Feature

- High Threshold Voltage = 3V
- Fast switching speed
- Reliable and Rugged
- ROHS Compliant & Halogen-Free

Applications

- DC-DC converter switching

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM60025NHV2A	TO-263-2L	Tape & Reel	800 / Tape & Reel	60025 □□□□□□

Note : □□□□□□ = Lot Code

Absolute Maximum Ratings (T_J=25°C Unless Otherwise Noted)

Symbol	Parameter	N-Channel	Unit
V_{DSS}	Drain-Source Voltage	60	V
V_{GSS}	Gate-Source Voltage	±20	
T_J	Maximum Junction Temperature	150	°C
T_{STG}	Storage Temperature Range	-55 to 150	°C
I_S	Diode Continuous Forward Current	$T_C=25^\circ C$ 109	A
I_{DM}	Pulse Drain Current Tested	$T_C=25^\circ C$ 400	A
$I_D^{(1)}$	Continuous Drain Current	$T_C=25^\circ C$ 187 ⁽¹⁾	A
		$T_C=100^\circ C$ 119	
P_D	Maximum Power Dissipation	$T_C=25^\circ C$ 192	W
		$T_C=100^\circ C$ 77	
$I_D^{(2)}$	Continuous Drain Current	$T_A=25^\circ C$ 19.2	A
		$T_A=100^\circ C$ 15.3	
$P_D^{(2)}$	Maximum Power Dissipation	$T_A=25^\circ C$ 2.0	W
		$T_A=100^\circ C$ 1.3	
$I_{AS}^{(3)}$	Avalanche Current, Single pulse	L=0.1mH 52	A
		L=0.5mH 30	A
$E_{AS}^{(3)}$	Avalanche Energy, Single pulse	L=0.1mH 135	mJ
		L=0.5mH 225	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	0.65
$R_{\theta JA}^{(2)}$	Thermal Resistance-Junction to Ambient	Steady State	62

Note ① : Max. current is limited by junction temperature

Note ② : Surface Mounted on 1in² FR-4 board with 1oz.

Note ③ : UIS tested and pulse width are limited by maximum junction temperature 150°C

N-Channel Electrical Characteristics (T_J=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250uA	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V _{DS} =48V, V _{GS} =0V	-	-	1	uA
V_{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	2	3	4	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		2.75	3.3	mΩ
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =10A	-	29	-	S
Dynamic Characteristics^⑤						
R_G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Freq.=1MHz	-	1	-	Ω
C_{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =30V, Freq.=1MHz	-	5552	-	pF
C_{oss}	Output Capacitance		-	1015	-	
C_{rss}	Reverse Transfer Capacitance		-	95	-	
t_{d(ON)}	Turn-on Delay Time	V _{GS} =10V, V _{DS} =30V, I _D =1A, R _{GEN} =1Ω	-	21.8	-	nS
t_r	Turn-on Rise Time		-	10.2	-	
t_{d(OFF)}	Turn-off Delay Time		-	47.2	-	
t_f	Turn-off Fall Time		-	78.2	-	
Q_g	Total Gate Charge	V _{GS} =6V, V _{DS} =30V, I _D =20A	-	55	-	nC
Q_g	Total Gate Charge	V _{GS} =10V, V _{DS} =30V, I _D =20A	-	82	-	
Q_{gs}	Gate-Source Charge		-	27.8	-	
Q_{gd}	Gate-Drain Charge		-	13.5	-	
Source-Drain Characteristics						
V_{SD}^④	Diode Forward Voltage	I _{SD} =10A, V _{GS} =0V	-	0.75	1.1	V
t_{rr}	Reverse Recovery Time	I _F =10A, V _R =30V	-	34.5	-	nS
Q_{rr}	Reverse Recovery Charge	di _F /dt=100A/μs	-	32.2	-	nC

Note ④ : Pulse test (pulse width≤300us, duty cycle≤2%).

Note ⑤ : Guaranteed by design, not subject to production testing.

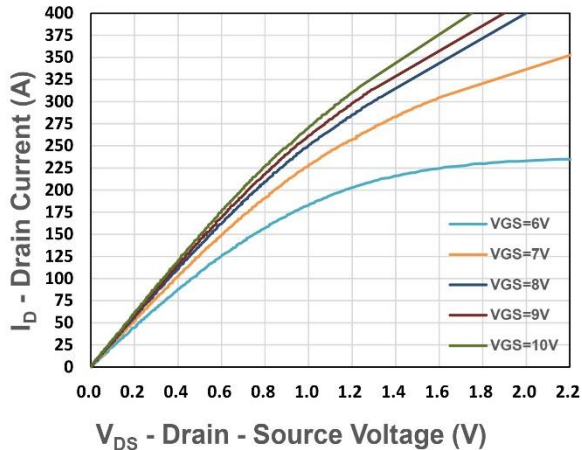


Figure 1. Output Characteristics

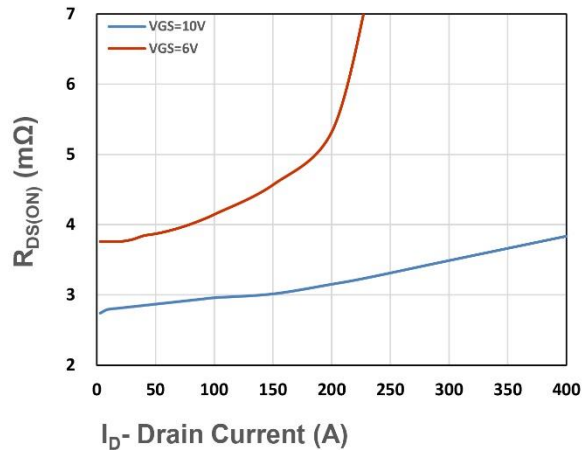


Figure 2. On-Resistance vs. ID

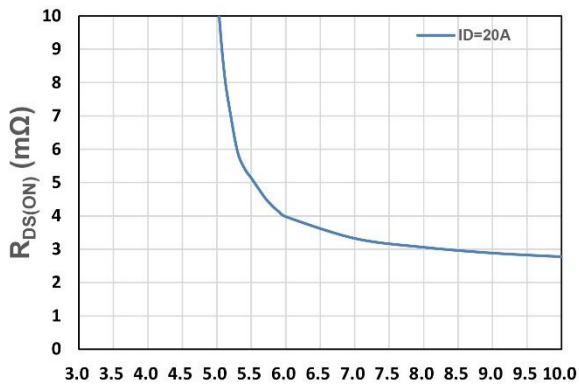


Figure 3. On-Resistance vs. VGS

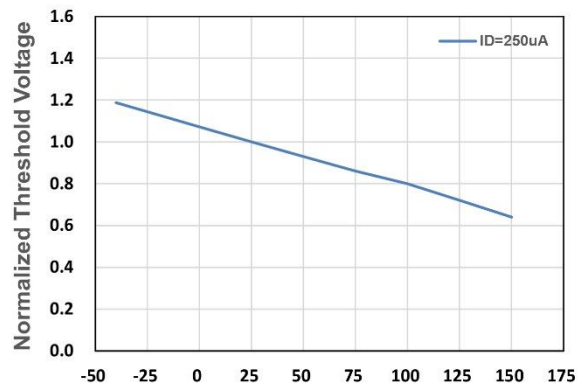


Figure 4. Gate Threshold Voltage

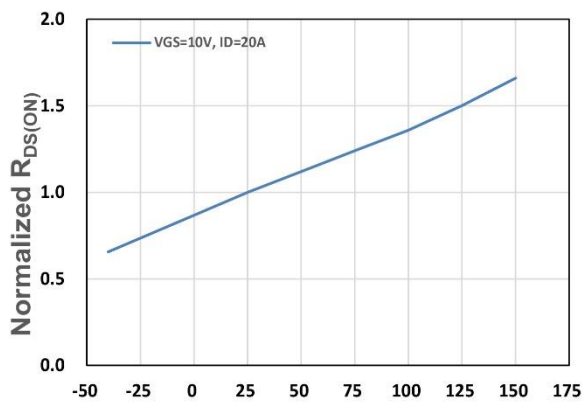


Figure 5. Drain-Source On Resistance

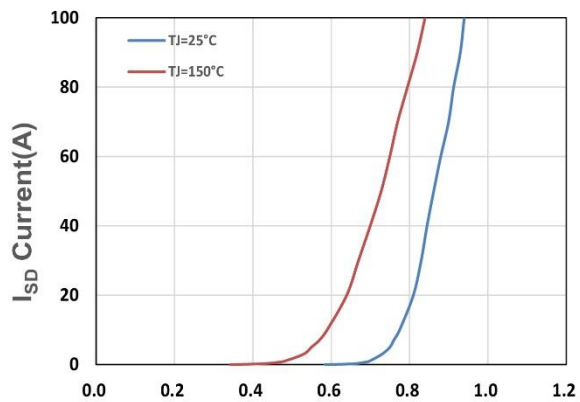
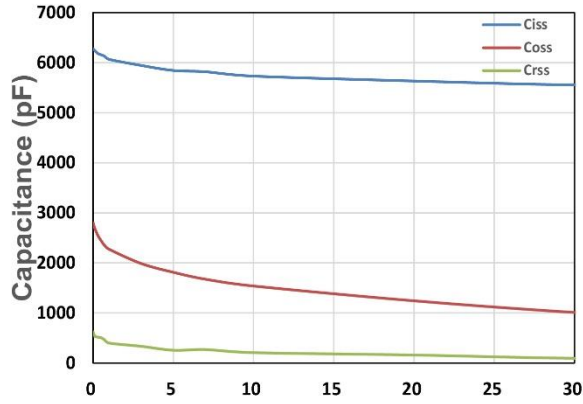
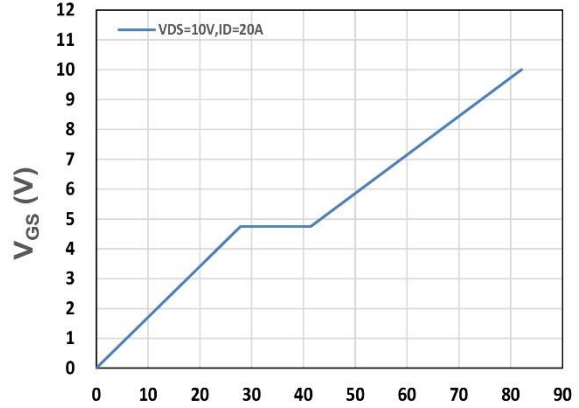


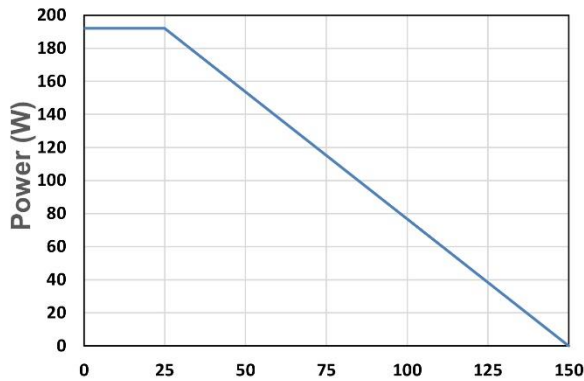
Figure 6. Source-Drain Diode Forward



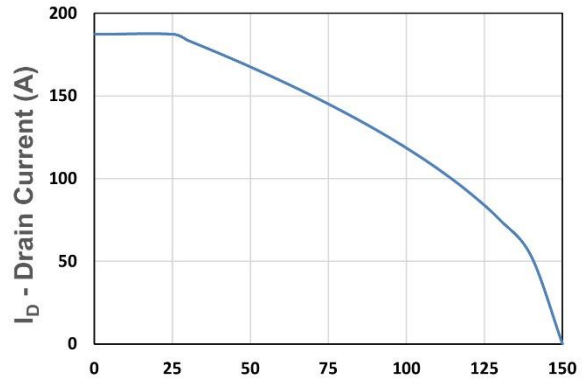
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



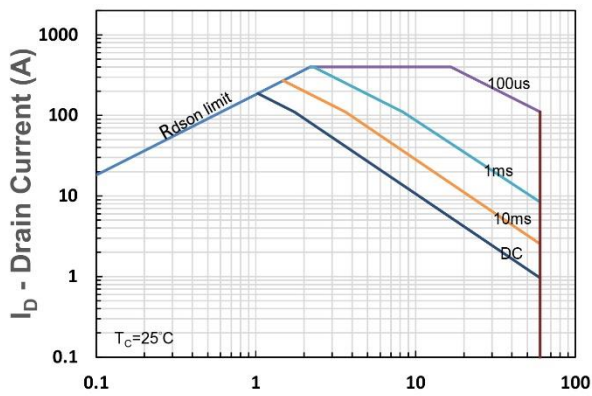
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



T_c - Case Temperature (°C)
Figure 9. Power Dissipation



T_c - Case Temperature (°C)
Figure 10. Drain Current



V_{DS} - Drain-Source Voltage (V)
Figure 11. Safe Operating Area

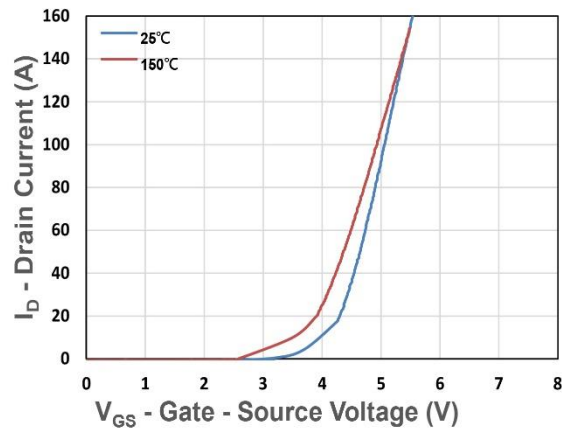


Figure 12. Transfer Characteristics

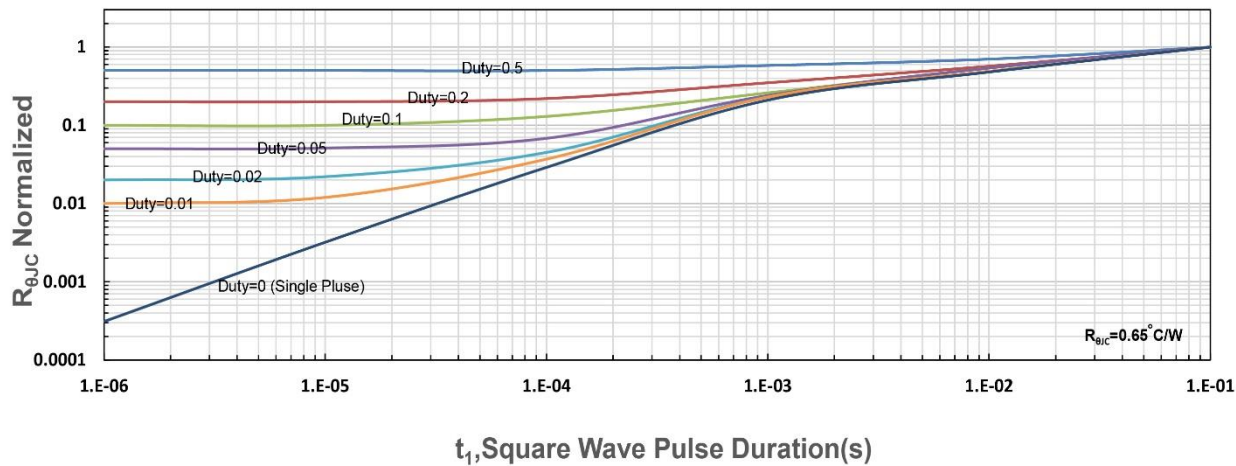


Figure 13. $R_{\theta JC}$ Transient Thermal Impedance