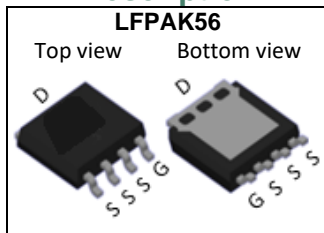
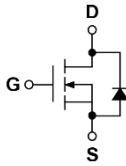


N-Channel Enhancement Mode MOSFET

Pin Description



Symbol



Product Summary

Symbol	N-Channel	Unit
V_{DSS}	40	V
$R_{DS(ON)-Max}$	1.2	m Ω
I_D	276	A

Feature

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS and Rg Tested
- Moisture Sensitivity Level MSL1

Applications

- DC-to-DC converters
- Switch Mode Power Supply
- Brushless DC motor control

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
SL276N04M	LFPAK56	Tape & Reel	4000 / Tape & Reel	

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

Symbol	Parameter	N-Channel	Unit
V_{DSS}	Drain-Source Voltage	40	V
V_{GSS}	Gate-Source Voltage	± 20	
T_J	Maximum Junction Temperature	175	°C
T_{STG}	Storage Temperature Range	-55 to 175	°C
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 75	A
I_{SP}	Diode Pulse Current	$T_C=25^\circ\text{C}$ 400 ^①	A
I_{DM}	Pulse Drain Current Tested	$T_C=25^\circ\text{C}$ 800 ^①	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$ 276	A
		$T_C=100^\circ\text{C}$ 195	
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 125	W
		$T_C=100^\circ\text{C}$ 62.5	
I_D	Continuous Drain Current	$T_A=25^\circ\text{C}$ 45	A
		$T_A=70^\circ\text{C}$ 38	
P_D	Maximum Power Dissipation	$T_A=25^\circ\text{C}$ 3.3	W
		$T_A=70^\circ\text{C}$ 2.3	
$I_{AS}^{②}$	Avalanche Current, Single pulse	L=0.1mH 48	A
		L=0.5mH 25	
$E_{AS}^{②}$	Avalanche Energy, Single pulse	L=0.1mH 115	mJ
		L=0.5mH 156	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	1.2
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	Steady State	45

Note ① : Max. current is limited by bonding

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150°C

Note ③ : Surface Mounted on 1in² FR-4 board with 1oz

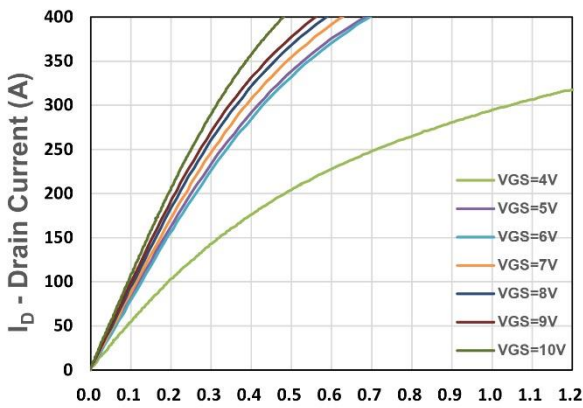
N-Channel Electrical Characteristics ($T_J=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=32V, V_{GS}=0V$	-	-	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1	1.7	2.3	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
$R_{DS(on)}^{(4)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=20A$	-	1.0	1.2	m Ω
		$V_{GS}=4.5V, I_{DS}=10A$	-	1.6	2	
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_{DS}=10A$	-	48	-	S
Dynamic Characteristics⁽⁶⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V,$ Freq.=1MHz	-	1.3	-	Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=20V,$ Freq.=1MHz	-	4930	-	pF
C_{oss}	Output Capacitance		-	2005	-	
C_{rss}	Reverse Transfer Capacitance		-	68	-	
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=10V, V_{DS}=20V,$ $I_D=20A, R_{GEN}=3\Omega$	-	10.5	-	nS
t_r	Turn-on Rise Time		-	25.4	-	
$t_{d(off)}$	Turn-off Delay Time		-	65.5	-	
t_f	Turn-off Fall Time		-	54	-	
Q_g	Total Gate Charge	$V_{GS}=10V, V_{DS}=20V,$ $I_D=20A$	-	70	-	nC
Q_{gs}	Gate-Source Charge		-	17	-	
Q_{gd}	Gate-Drain Charge		-	10.5	-	
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	$I_F=20A, V_R=20V$	-	48.8	-	nS
Q_{rr}	Reverse Recovery Charge	$di_F/dt=100A/\mu s$	-	35.8	-	nC

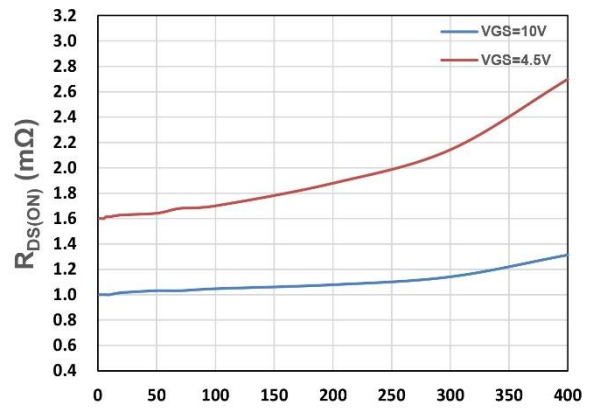
Note ④ : Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

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

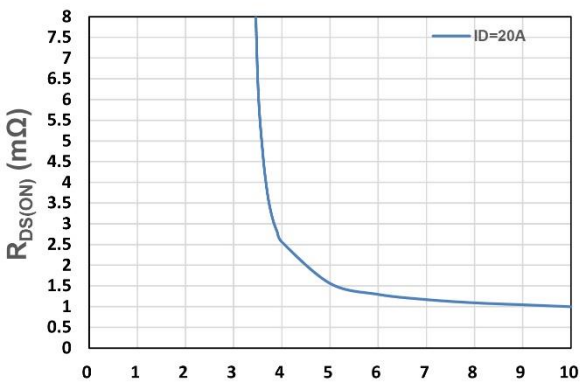
N-Channel Typical Characteristics



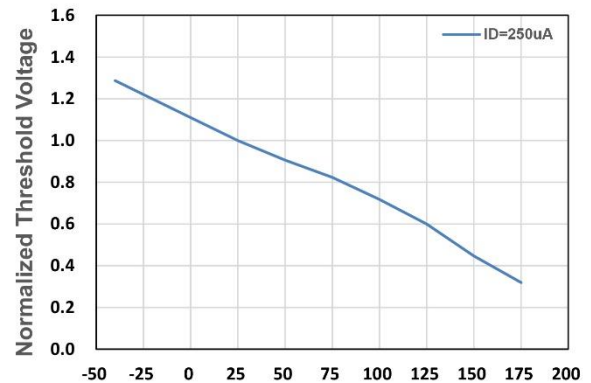
V_{DS} - Drain - Source Voltage (V)
Figure 1. Output Characteristics



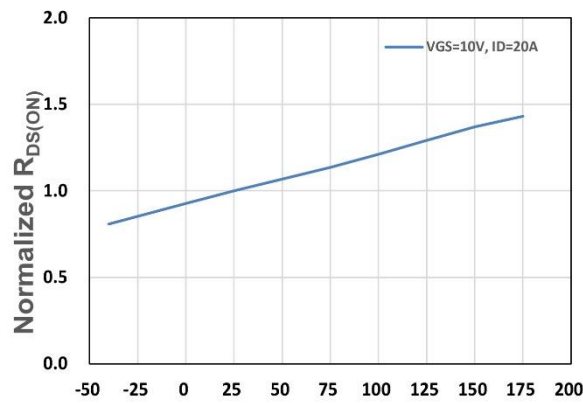
I_D - Drain Current (A)
Figure 2. On-Resistance vs. I_D



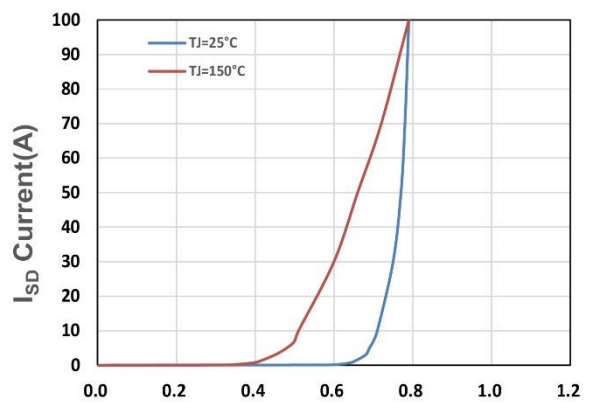
V_{GS} - Gate - Source Voltage (V)
Figure 3. On-Resistance vs. V_{GS}



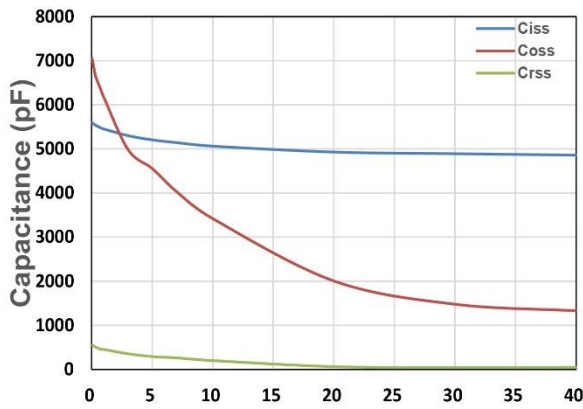
T_j , Junction Temperature($^{\circ}C$)
Figure 4. Gate Threshold Voltage



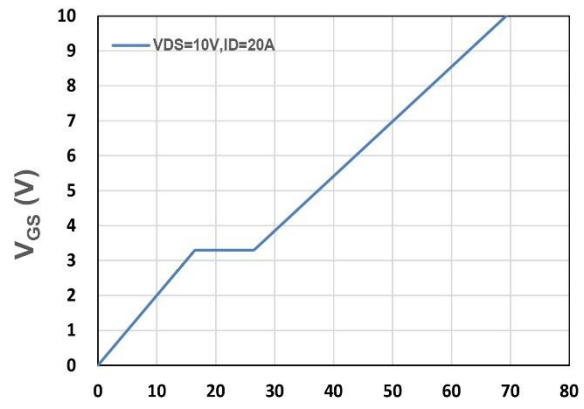
T_j , Junction Temperature($^{\circ}C$)
Figure 5. Drain-Source On Resistance



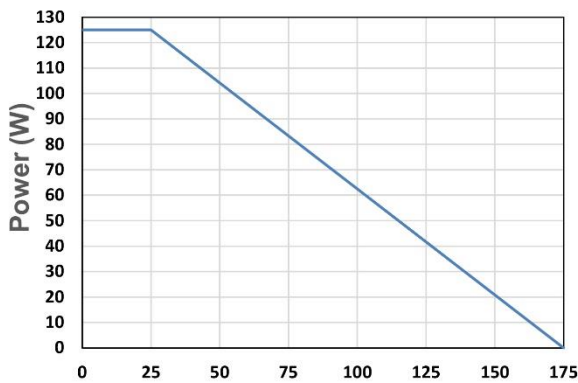
V_{SD} , Source-Drain Voltage(V)
Figure 6. Source-Drain Diode Forward



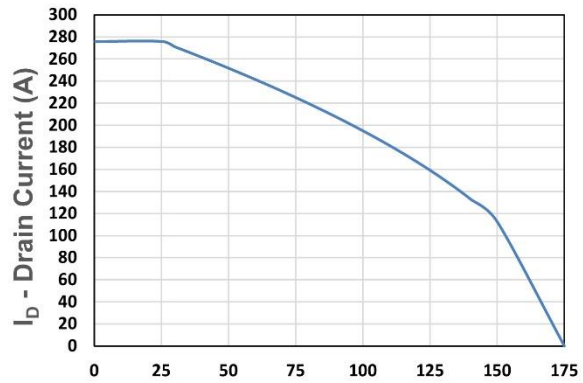
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



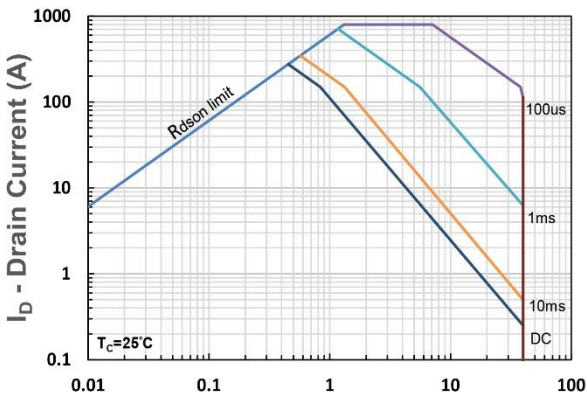
Qg, Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



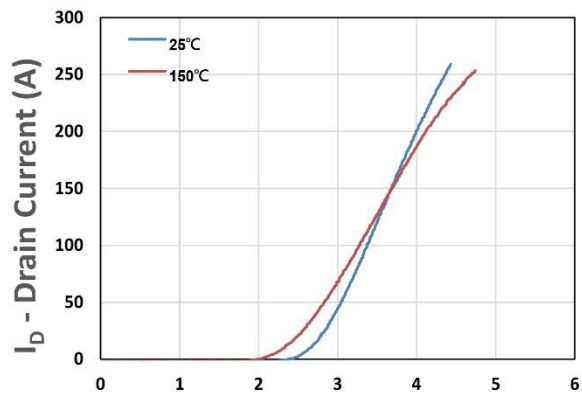
Tc - Case Temperature (°C)
Figure 9. Power Dissipation



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



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



V_{GS} - Gate - Source Voltage (V)
Figure 12. Transfer Characteristics

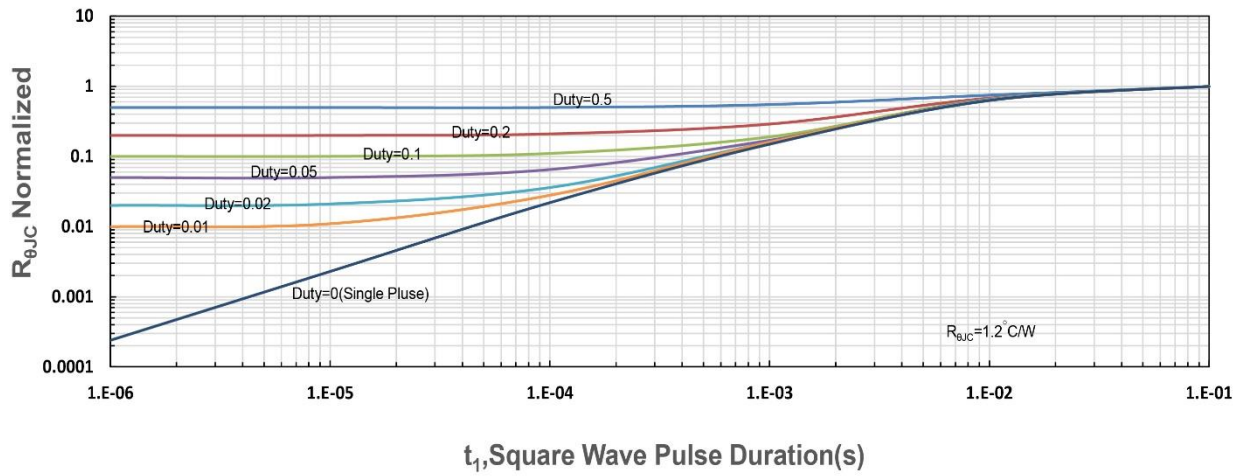


Figure 13. $R_{\theta JC}$ Transient Thermal Impedance