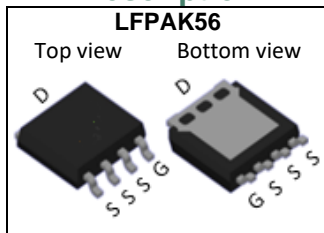
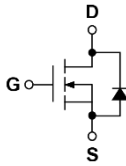


N-Channel Enhancement Mode MOSFET

Pin Description



Symbol



Product Summary

Symbol	N-Channel	Unit
V _{DSS}	40	V
R _{DS(ON)-Max}	0.9	mΩ
I _D	318	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
SL318N04M	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°C	100	A
I _{SP}	Diode Pulse Current	T _C =25°C	400 ^①	A
I _{DM}	Pulse Drain Current Tested	T _C =25°C	800 ^①	A
I _D	Continuous Drain Current	T _C =25°C	318	A
		T _C =100°C	225	
P _D	Maximum Power Dissipation	T _C =25°C	125	W
		T _C =100°C	62.5	
I _D	Continuous Drain Current	T _A =25°C	52	A
		T _A =70°C	44	
P _D	Maximum Power Dissipation	T _A =25°C	3.3	W
		T _A =70°C	2.3	
I _{AS} ^②	Avalanche Current, Single pulse	L=0.1mH	64	A
		L=0.5mH	34	
E _{AS} ^②	Avalanche Energy, Single pulse	L=0.1mH	204	mJ
		L=0.5mH	290	

Thermal Characteristics

Symbol	Parameter	Rating	Unit	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	1.2	°C/W
R _{θJA} ^③	Thermal Resistance-Junction to Ambient	Steady State	45	°C/W

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°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	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V _{DS} =32V, V _{GS} =0V	-	-	1	uA
V_{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	1	1.7	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	-	0.7	0.9	mΩ
		V _{GS} =4.5V, I _{DS} =10A	-	1.15	1.5	
gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =10A	-	45	-	S
Dynamic Characteristics ^⑤						
R_G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Freq.=1MHz	-	1.2	-	Ω
C_{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, Freq.=1MHz	-	4928	-	pF
C_{oss}	Output Capacitance		-	2000	-	
C_{rss}	Reverse Transfer Capacitance		-	65	-	
td(ON)	Turn-on Delay Time	V _{GS} =10V, V _{DS} =20V, I _D =20A, R _{GEN} =3Ω	-	10.7	-	nS
t_r	Turn-on Rise Time		-	25.3	-	
t_{d(OFF)}	Turn-off Delay Time		-	65.2	-	
t_f	Turn-off Fall Time		-	53.6	-	
Q_g	Total Gate Charge	V _{GS} =10V, V _{DS} =20V, I _D =20A	-	69	-	nC
Q_{gs}	Gate-Source Charge		-	16.5	-	
Q_{gd}	Gate-Drain Charge		-	10	-	
Source-Drain Characteristics						
V_{SD} ^④	Diode Forward Voltage	I _{SD} =10A, V _{GS} =0V	-	0.72	1.1	V
t_{rr}	Reverse Recovery Time	I _F =20A, V _R =20V	-	48.6	-	nS
Q_{rr}	Reverse Recovery Charge	dI _F /dt=100A/μs	-	35.5	-	nC

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

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

N-Channel Typical Characteristics

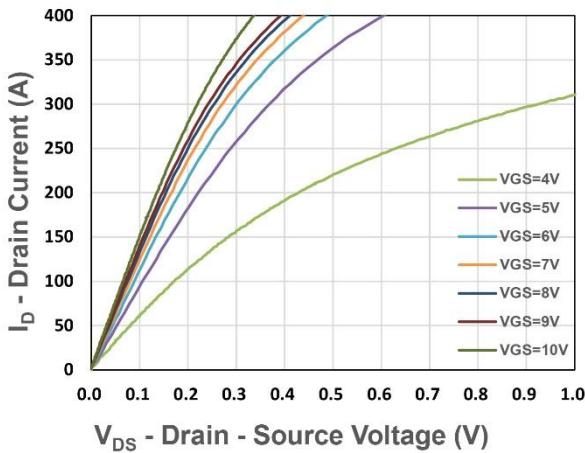


Figure 1. Output Characteristics

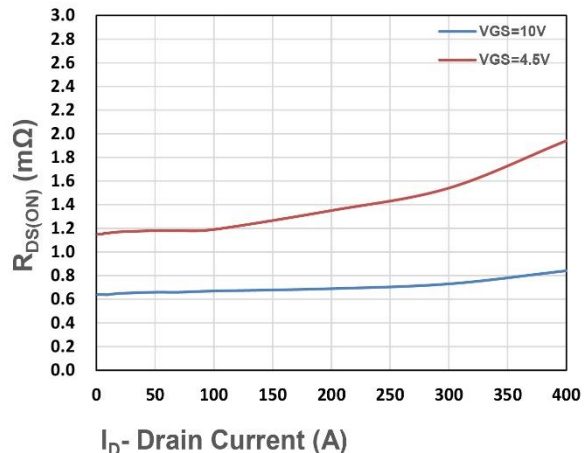


Figure 2. On-Resistance vs. ID

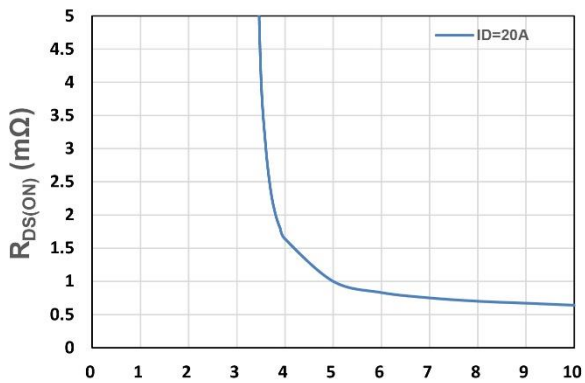


Figure 3. On-Resistance vs. VGS

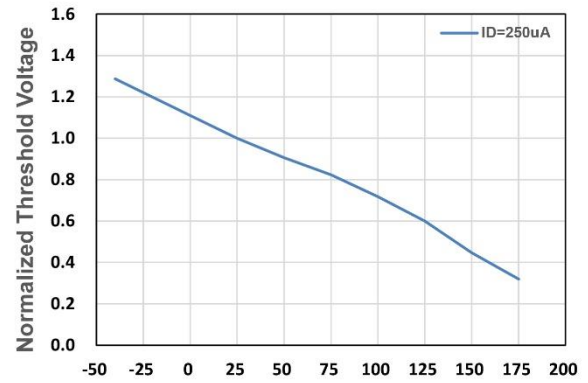


Figure 4. Gate Threshold Voltage

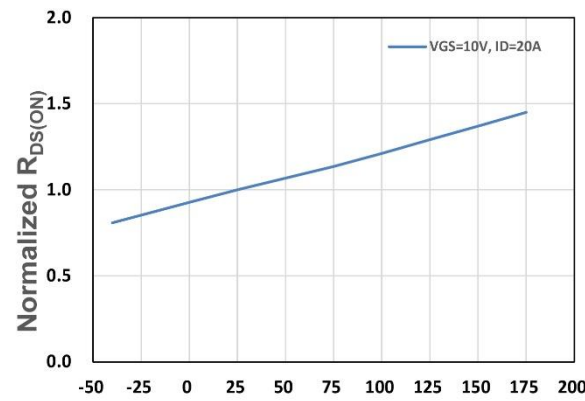


Figure 5. Drain-Source On Resistance

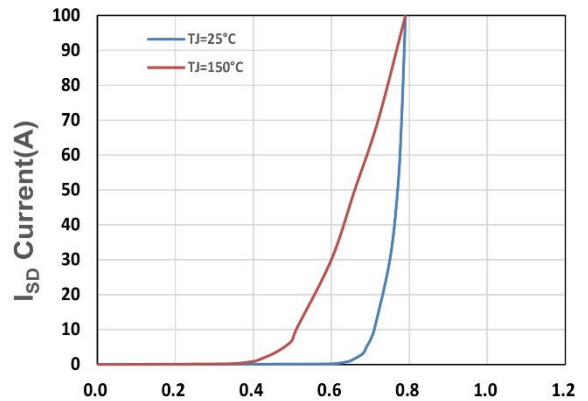
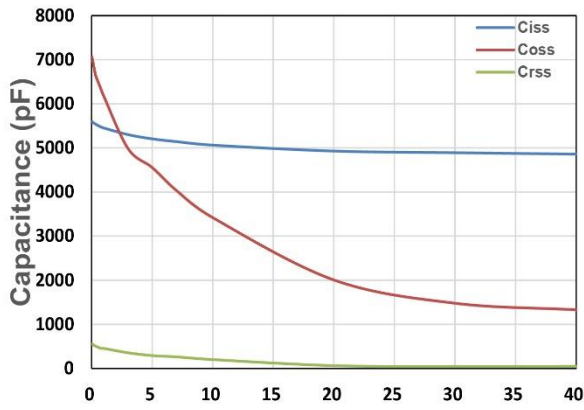
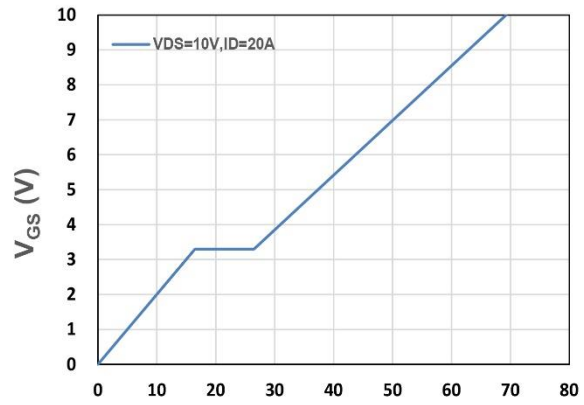


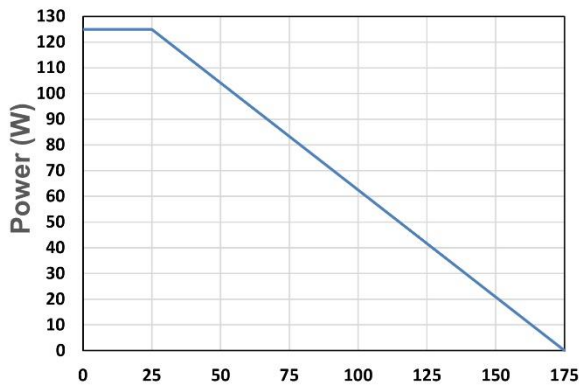
Figure 6. Source-Drain Diode Forward



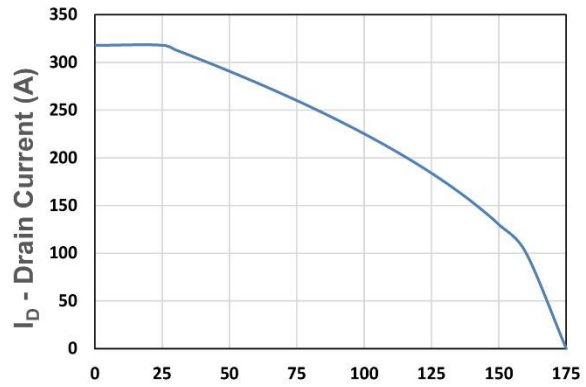
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



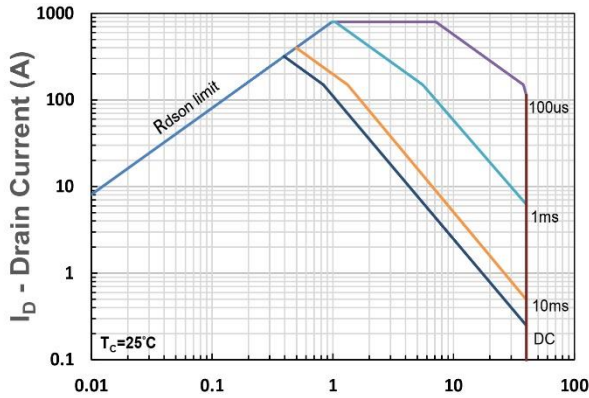
Qg, Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



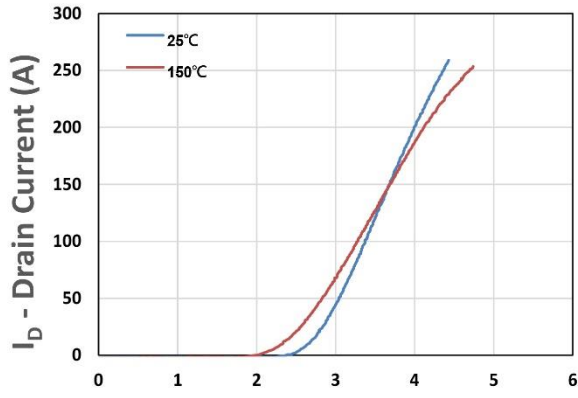
Tc - Case Temperature (°C)
Figure 9. Power Dissipation



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

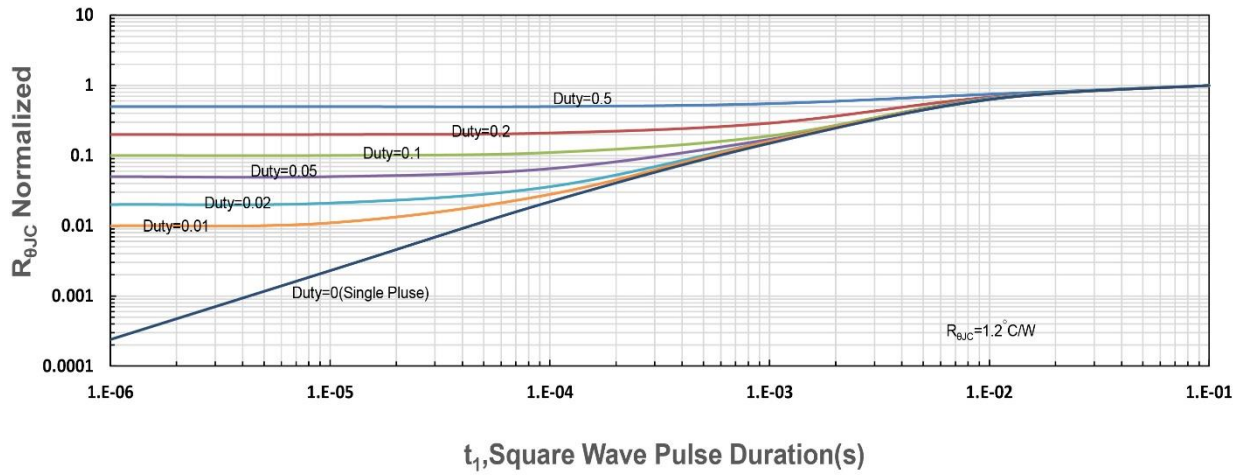


Figure 13. $R_{\theta JC}$ Transient Thermal Impedance