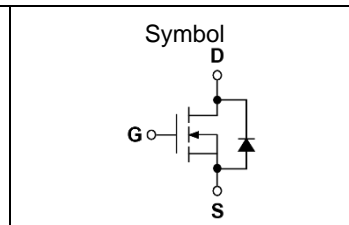
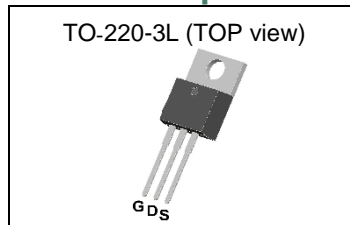


N-Channel Enhancement Mode MOSFET

Pin Description



Ordering Information

Symbol	N-Channel	Unit
V_{DSS}	100	V
$R_{DS(ON)-Max}$	6.4	mΩ
I_D	102	A

Feature

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant & Halogen-Free
- 100% UIS Tested

Applications

- Portable Equipment
- Battery Powered System

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
SL102N10	TO-220-3L	Tube	50 / Tube	

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

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	122	A
I_D	Continuous Drain Current	T _c =25°C	102	A
		T _c =100°C	65	
P_D	Maximum Power Dissipation	T _c =25°C	125	W
		T _c =100°C	50	
$I_{AS}^{②}$	Avalanche Current, Single pulse	L=0.1mH	18	A
$E_{AS}^{②}$	Avalanche Energy, Single pulse	L=0.1mH	16	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit	
$R_{θJC}$	Thermal Resistance-Junction to Case	Steady State	1	°C/W
$R_{θJA}^{③}$	Thermal Resistance-Junction to Ambient	Steady State	62.5	°C/W

Note ① : Max. current is limited by bonding wire

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.

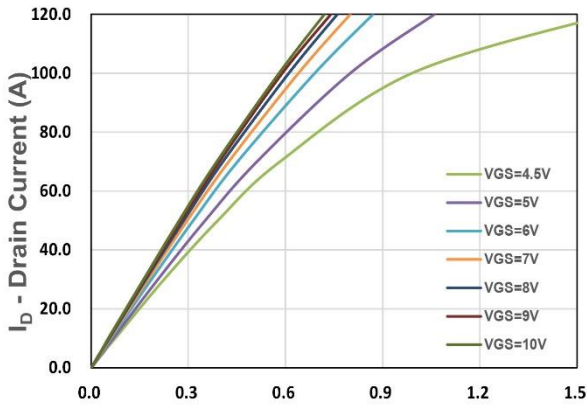
N-Channel Electrical Characteristics ($T_J=25^{\circ}\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=80V, V_{GS}=0V$	-	-	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1	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	$V_{GS}=10V, I_{DS}=20A$	-	5.3	6.4	m Ω
		$V_{GS}=4.5V, I_{DS}=20A$	-	7	9	
gfs	Forward Transconductance	$V_{DS}=5V, I_{DS}=10A$	-	3.2	-	S
Dynamic Characteristics ⁽⁶⁾						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V,$ Freq.=1MHz	-	1.8	-	Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=50V,$ Freq.=1MHz	-	3010	-	pF
C_{oss}	Output Capacitance					
C_{rss}	Reverse Transfer Capacitance					
$t_{d(on)}$	Turn-on Delay Time	$V_{GS}=10V, V_{DS}=50V,$ $I_D=1A, R_{GEN}=3\Omega$	-	11.5	-	nS
t_r	Turn-on Rise Time					
$t_{d(off)}$	Turn-off Delay Time					
t_f	Turn-off Fall Time					
Q_g	Total Gate Charge	$V_{GS}=4.5V, V_{DS}=50V$ $I_D=20A$	-	32.5	-	nC
Q_g	Total Gate Charge	$V_{GS}=10V, V_{DS}=50V,$ $I_D=20A$	-	60	-	
Q_{gs}	Gate-Source Charge		-	8.2	-	
Q_{gd}	Gate-Drain Charge		-	16.5	-	
Source-Drain Characteristics						
$V_{SD}^{(4)}$	Diode Forward Voltage	$I_{SD}=20A, V_{GS}=0V$	-	0.85	1.1	V
t_{rr}	Reverse Recovery Time	$I_F=20A, V_R=50V$	-	55.7	-	nS
Q_{rr}	Reverse Recovery Charge	$di_F/dt=100A/\mu s$	-	109	-	nC

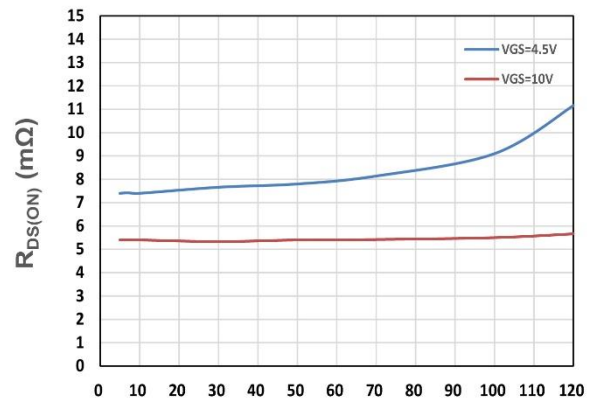
Note ④ : Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

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

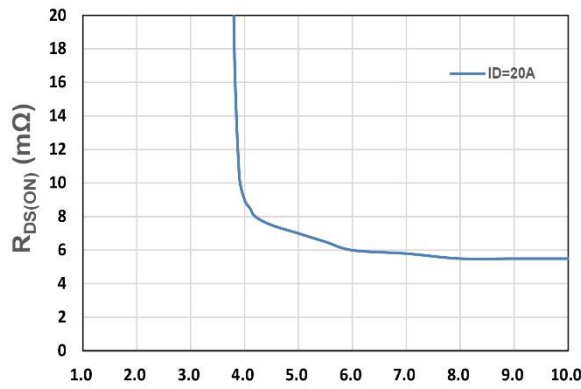
N-Channel Typical Characteristics



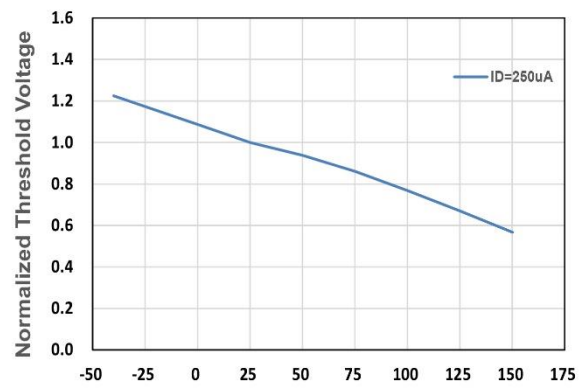
V_{DS} - Drain - Source Voltage (V)
Figure 1. Output Characteristics



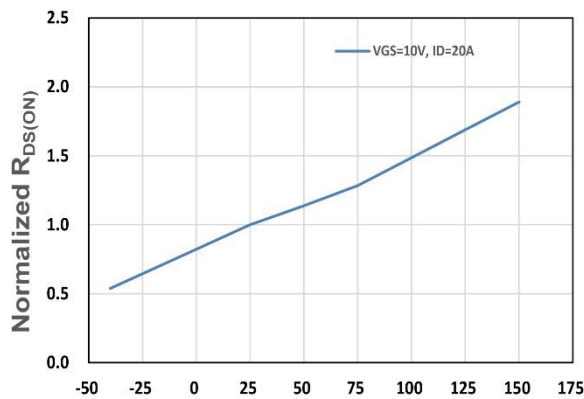
ID - Drain Current (A)
Figure 2. On-Resistance vs. ID



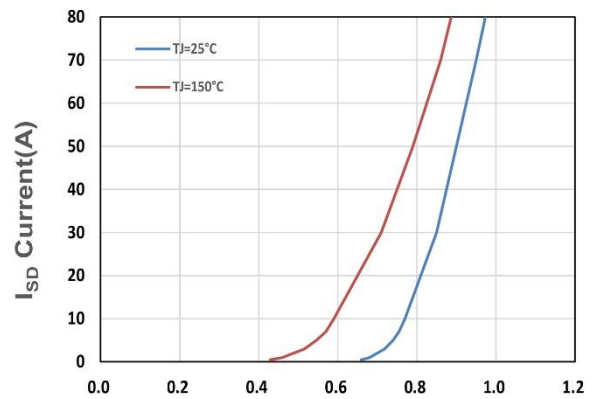
V_{GS} - Gate - Source Voltage (V)
Figure 3. On-Resistance vs. VGS



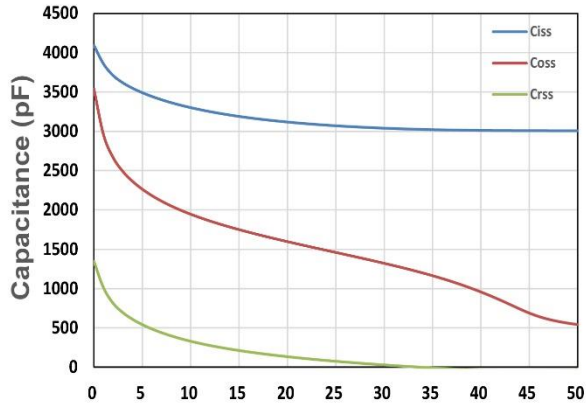
T_j, Junction Temperature(°C)
Figure 4. Gate Threshold Voltage



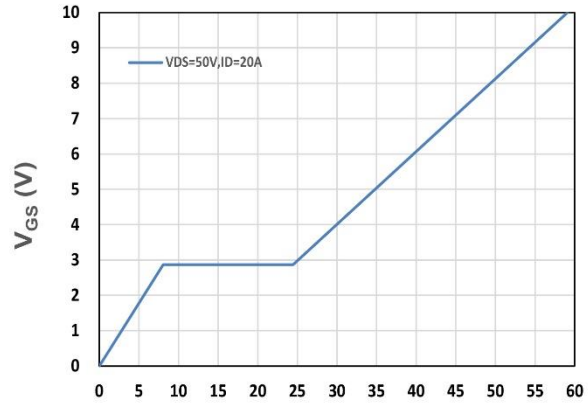
T_j, Junction Temperature(°C)
Figure 5. Drain-Source On Resistance



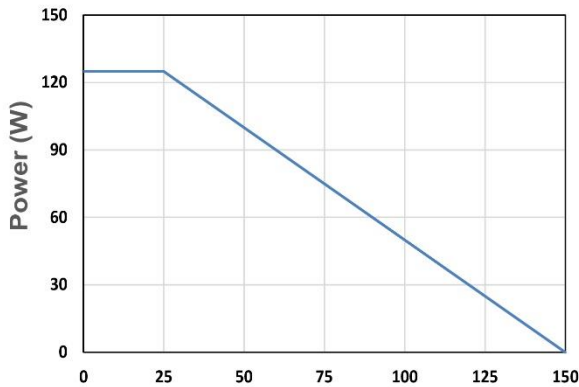
V_{SD}, Source-Drain Voltage(V)
Figure 6. Source-Drain Diode Forward



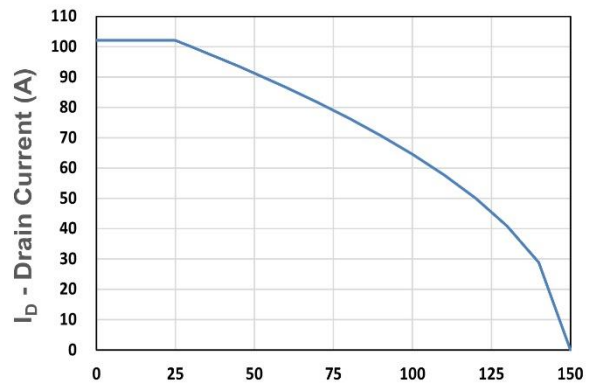
V_{DS} - Drain - Source Voltage (V)
Figure 7. Capacitance



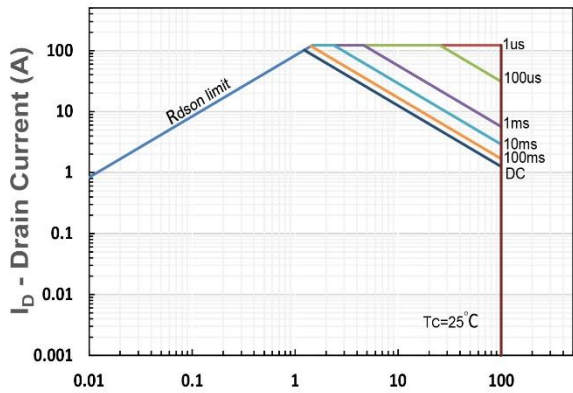
Q_g , Total Gate Charge (nC)
Figure 8. Gate Charge Characteristics



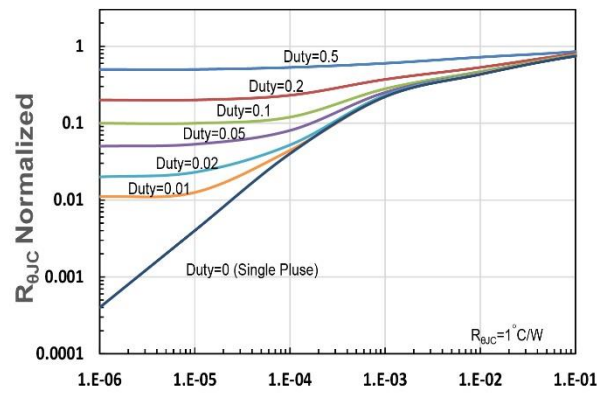
T_c - Case Temperature(°C)
Figure 9. Power Dissipation



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



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



t_1 , Square Wave Pulse Duration(s)
Figure 12. $R_{\theta JC}$ Transient Thermal Impedance

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