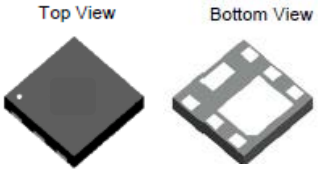
30V N-Channel Power MOSFET

DESCRIPTION：
- Ultra-low $R_{DS(ON)}$
- Low Gate Charge
- 100% UIS Tested, 100% Rg Tested
- RoHS compliant
- Pb-Free Lead Plating

V_{DS}	30V
I_D @V_{GS}=10V	29A
$R_{DS(ON)\_Typ.}$ @V_{GS}=10V	3.7mΩ



U-DFN2020-6L

TYPICAL APPLICATIONS：
- Power Management
- Current Switching in DC/DC & AC/DC (SR) Sub-system
- Quick/Wireless Charging, Motor Driving

3MAXIMUM RATINGS (at T_A = 25 °C, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	Tc=25℃ Tc=100℃	I_D	29 18	A
Pulsed Drain Current (1)		I_{DM}	116	A
Avalanche Current (2)		I_{AS}	20	A
Avalanche Energy (2)		E_{AS}	20	mJ
Power dissipation	Tc=25℃ Tc=100℃	P_D	6.3 2.5	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+150	℃

Notes： 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. This single-pulse measurement was taken under the following condition [L = 100uH, V_{GS} = 10V, V_{DS} = 15V] while its value is limited by T_{J_Max} = 150°C.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	85 20	℃/W

ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 1000uA	$V_{(BR)DSS}$	30			V
Zero Gate Voltage Drain Current VDS = 24 V, VGS = 0 V	I_{DSS}			1	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	1.2	1.6	2.5	V
Drain-Source On-State Resistance VGS = 10V, ID = 15A VGS = 4.5V, ID = 10A	$R_{DS(on)}$		 3.7 5.3	 4.8 7.0	mΩ
Forward Transconductance VDS = 5V, ID = 15A	G_{FS}		198		S
Input capacitance f=1MHz, VDS=15 V, VGS=0 V	C_{iss}		866		pF
Output capacitance f=1MHz, VDS=15 V, VGS=0 V	C_{oss}		739		pF
Reverse transfer capacitance f=1MHz, VDS=15 V, VGS=0 V	C_{rss}		54		pF
Gate Resistance VDS=0 V, VGS= 0V, f=1MHz	R_g		1.8		Ω
Total Gate Charge VDS= 15V, ID= 15A, VGS= 10V VDS= 15V, ID= 15A, VGS= 4.5V	Q_G		 13.5 6.7		nC
Gate to Source Charge VDS= 15V, ID= 15A, VGS=0 to 10V	Q_{GS}		2.1		nC
Gate to Drain Charge VDS= 15V, ID= 15A, VGS=0 to 10V	Q_{GD}		2.0		nC
Turn-on delay time VDS=15 V, VGS= 10V, R_L=1.0Ω, R_{GEN}=6Ω	td (ON)		2.4		ns
Rise time VDS=15 V, VGS= 10V, R_L=1.0Ω, R_{GEN}=6Ω	tr		2.5		ns
Turn-off delay time VDS=15 V, VGS= 10V, R_L=1.0Ω, R_{GEN}=6Ω	td (OFF)		12.7		ns
Fall time VDS=15 V, VGS= 10V, R_L=1.0Ω, R_{GEN}=6Ω	tf		6.9		ns

Body Diode

ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Diode Forward Voltage VGS = 0V, I_S = 1A	V_{SD}		0.69	1.0	V
Diode Continuous Current, Tc=25℃	I_S			6	A
Revers Recovery Time IF=15A, dI_F/dt = 100A/us	Trr		26		ns
Revers Recovery Charge IF=15A, dI_F/dt = 100A/us	Qrr		10.6		nC

Typical Performance Characteristics

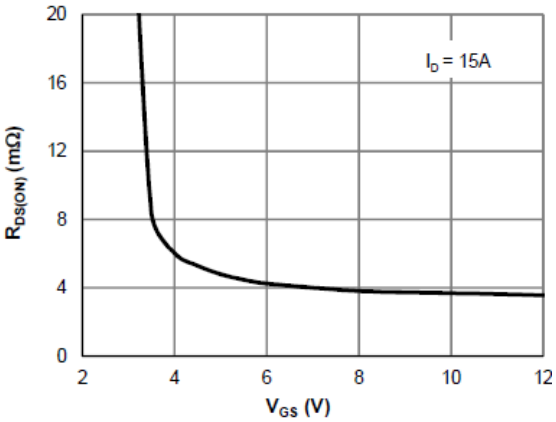


Figure 1. $R_{DS(ON)}$ vs. VGS

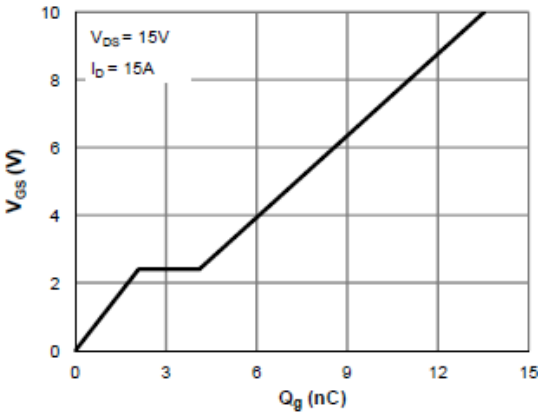


Figure 2. Gate Charge Characteristics

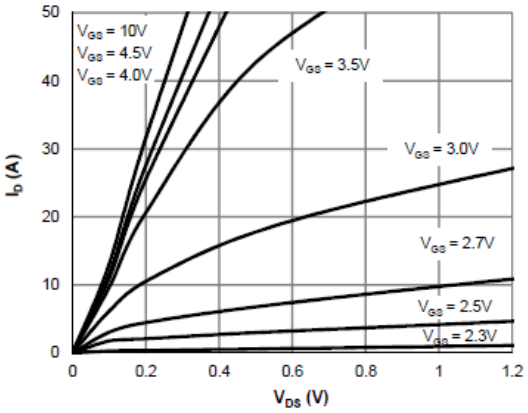


Figure 3. Saturation Characteristics

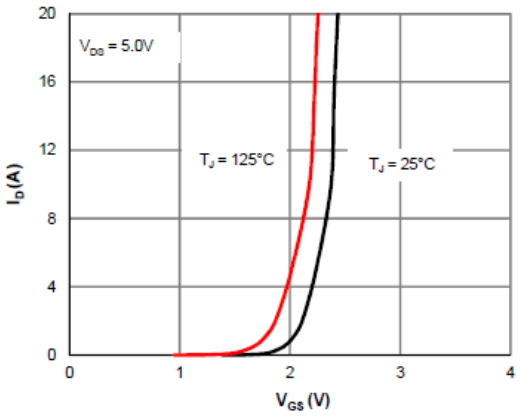


Figure 4. Transfer Characteristics

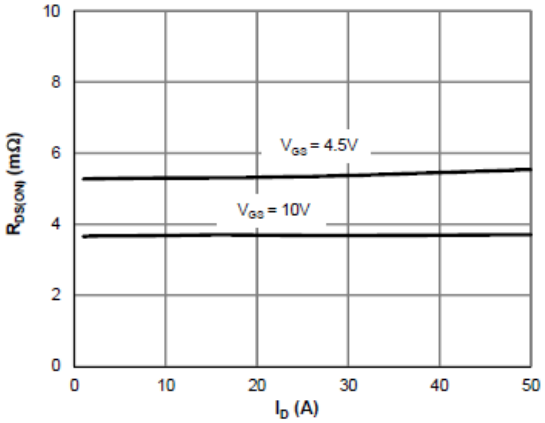


Figure 5. On-resistance vs. Drain Current

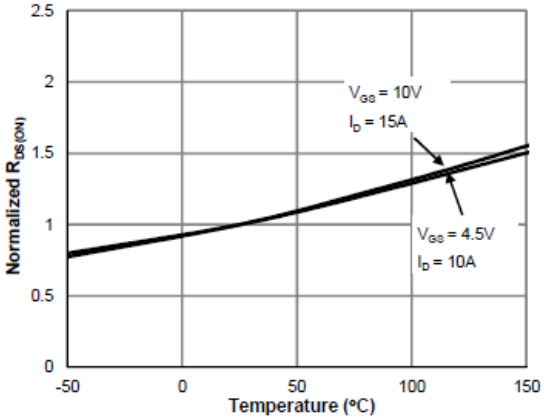


Figure 6. $R_{DS(ON)}$ vs. Junction Temperature

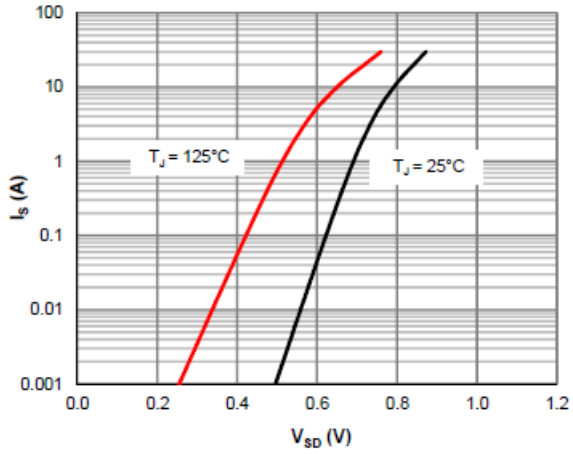


Figure 7. Body-Diode Characteristics

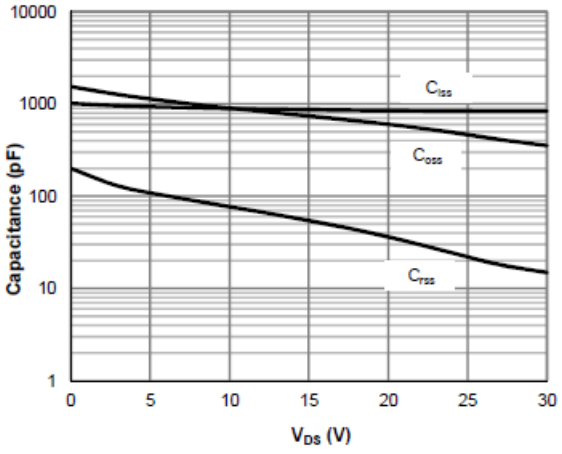


Figure 8. Capacitance Characteristics

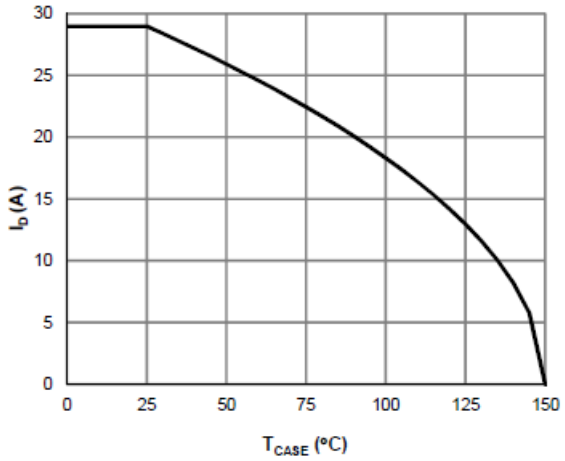


Figure . Current De-rating

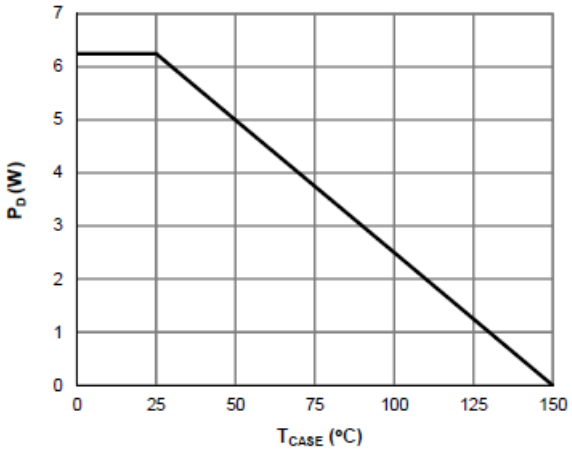


Figure 10. Power De-rating

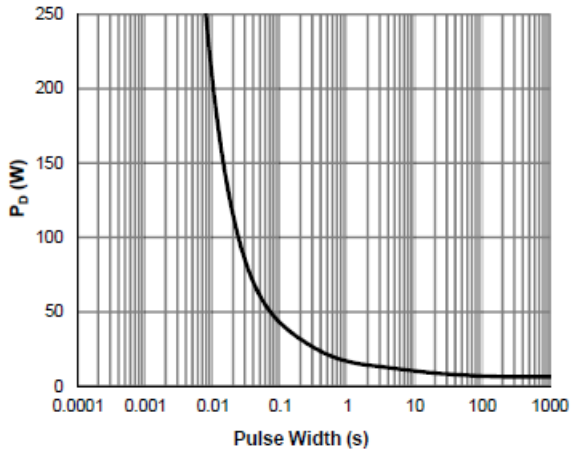


Figure 11. Single Pulse Power Rating, Junction-to-Case

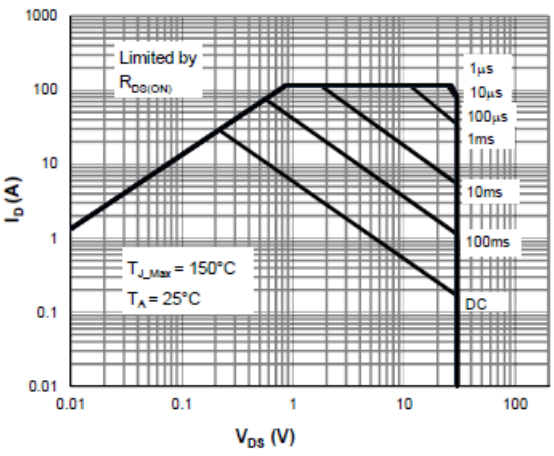


Figure 12. Maximum Safe Operating Area

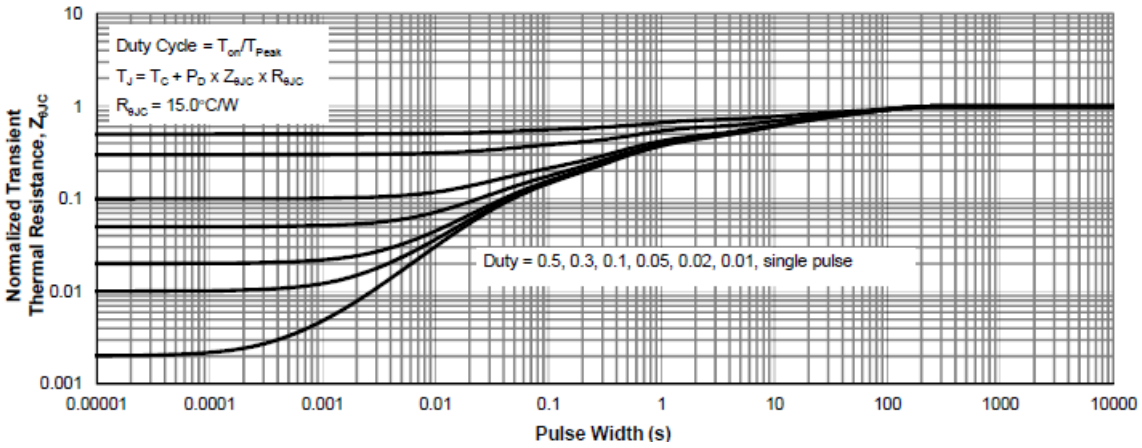
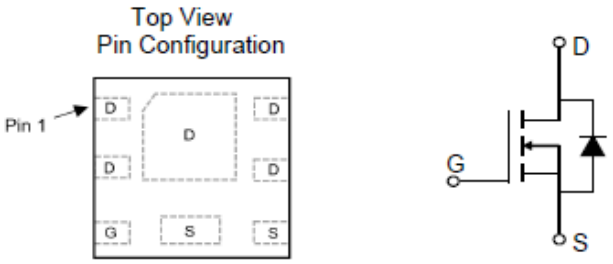
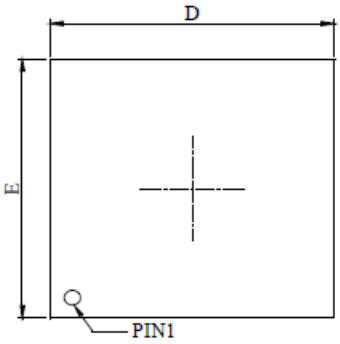


Figure 14. Normalized Maximum Transient Thermal Impedance

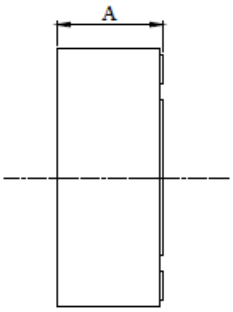
- Circuit diagram



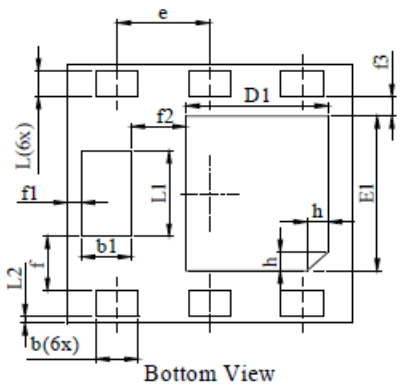
• Package outlines : Dimensions in (mm)



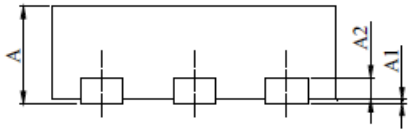
Top View



Side View



Bottom View



Front View

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.500	-	0.600
A1	-	-	0.005
A2	-	0.080	0.250
D	1.900	2.000	2.100
E	1.900	2.000	2.100
D1	0.900	1.000	1.100
E1	1.100	1.200	1.300
b	0.250	0.300	0.350
b1	0.300	0.350	0.400
L	0.150	0.200	0.250
L1	0.610	0.660	0.710
L2	0.010	0.050	0.090
e	0.650 BSC		
f	0.420 REF		
f1	0.100 REF		
f2	0.385 REF		
f3	0.150 REF		
h	0.150 REF		

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