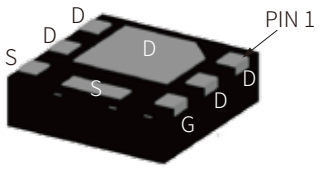
FEATURES

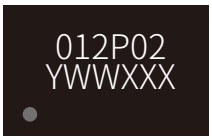
- Advanced trench cell design
- Low Thermal Resistance



DFN2020-6L

APPLICATION

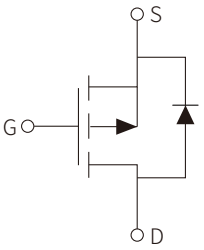
- Motor Drivers
- DC - DC Converter



Marking

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003



Schematic Symbol

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage T_C=25°C	V_{DS}	-20	V
Pulsed Source Current T_C=25°C,V_{GS}=-4.5V	I_{DM} *,**,***	-14	A
Drain Current T_C=25°C,V_{GS}=-4.5V	I_D *	-12	A
Gate-Source Voltage T_C=25°C	V_{GS}	±12	V
Total Power Dissipation T_C=25°C	P_{tot} *	20	W
Diode Forward Current T_C=25°C	I_S	-12	A
Junction Temperature	T_J	-55 to 150	°C
Storage Temperature	T_{STG}	-55 to 150	°C
Thermal Resistance –Junction to Ambient	$R_{\theta JC}$ *	78	°C/W

Notes:
* Surface Mounted on 1 in^2 pad area, t ≤10 sec
** Pulse width≤10 us, duty cycle≤ 1 %
*** Limited by bonding wire

ELECTRICAL CHARACTERISTICS (T_A=25°C)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=-250μA	-20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_{DS}=-250μA	-0.4	-0.7	-1.0	V
Zero Gate Voltage Source Current	I_{DSS}	V_{DS}=-12V,V_{GS}=0V			-1	μA
		V_{DS}=-12V,V_{GS}=0V,T_J=85°C			-30	μA
Gate Leakage Current	I_{GSS}	V_{GS}=±12V ,V_{DS}=0V			±100	nA
Drain-Source On-State Resistance	$R_{DS(on)}$[a]	V_{GS}=-4.5V,I_D=-8A		13	17	mΩ
		V_{GS}=-2.5V,I_D=-5A		18	22	mΩ
Diode Characteristics						
Diode Forward Voltage	V_{SD}[a]	I_{SD}=-2.6A,V_{GS}=0V			-1.2	V
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}			-8		A
Drain to Source Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=-8A		-32		A
Dynamic Characteristics[b]						
Input capacitance	C_{iss}	V_{GS}=0V,V_{DS}=-10V, Frequency = 1 MHz		2700		pF
Output capacitance	C_{oss}			680		pF
Reverse transfer capacitance	C_{rss}			590		pF
Turn-on Delay Time	$t_{d(on)}$	V_{DS}=-6V,V_{GEN}=-4.5V R_G= 2.5Ω, I_D=-4A,		11		nS
Turn-on Rise Time	t_r			35		nS
Turn-Off Delay Time	$t_{d(off)}$			30		nS
Turn-Off Fall Time	t_f			10		nS
Gate Charge Characteristics[b]						
Total Gate Charge	Q_g	V_{DS}=-4.5V,V_{GS}=-6V,I_{DS}=-8A		35		nC
Gate-Source Charge	Q_{gs}			5		nC
Gate-Drain Charge	Q_{gd}			10		nC

Notes:
a : Pulse test ; pulse width≤300μs, duty cycle≤2 %
b : Guaranteed by design, not subject to production testing

PARAMETER CHARACTERISTIC CURVE

Figure1: Power Capability

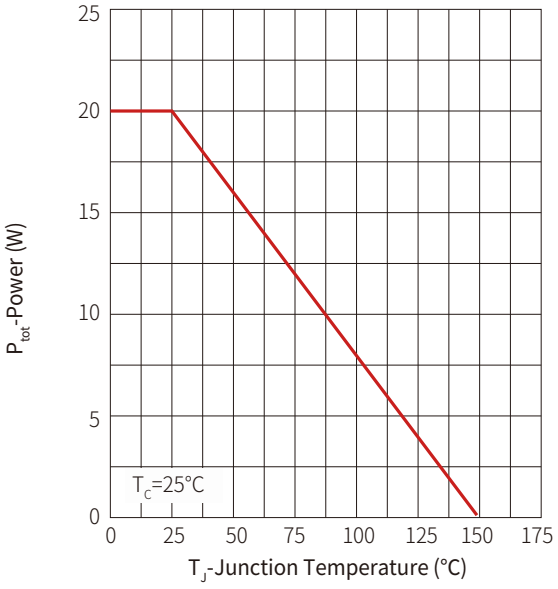


Figure2: Current Capability

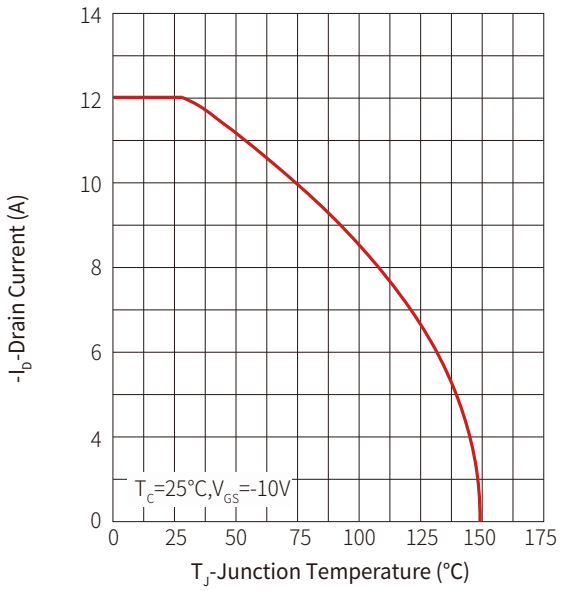


Figure3: Safe operating Area

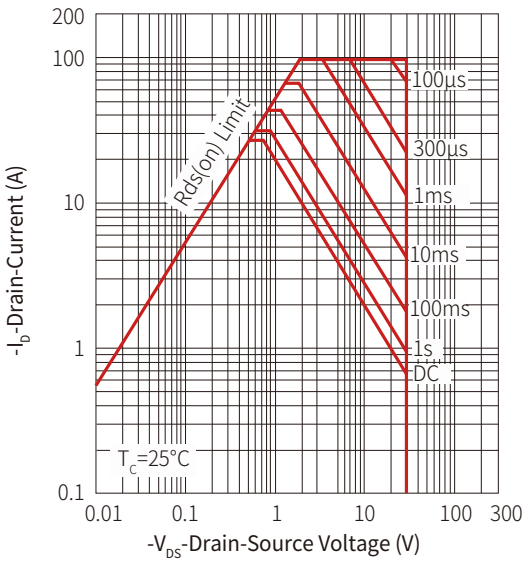


Figure 4: Transient Thermal Impedance

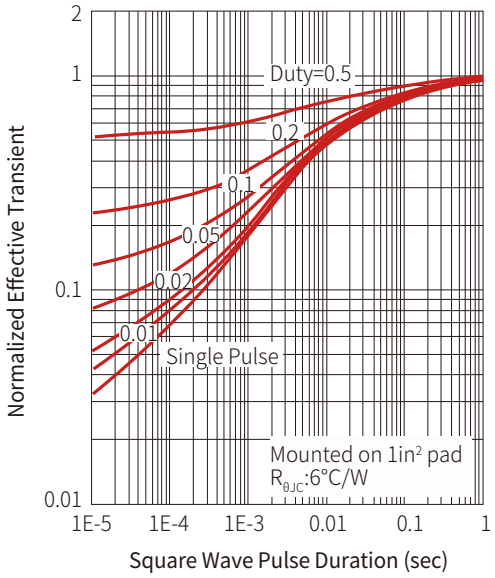


Figure 5:Output Characteristics

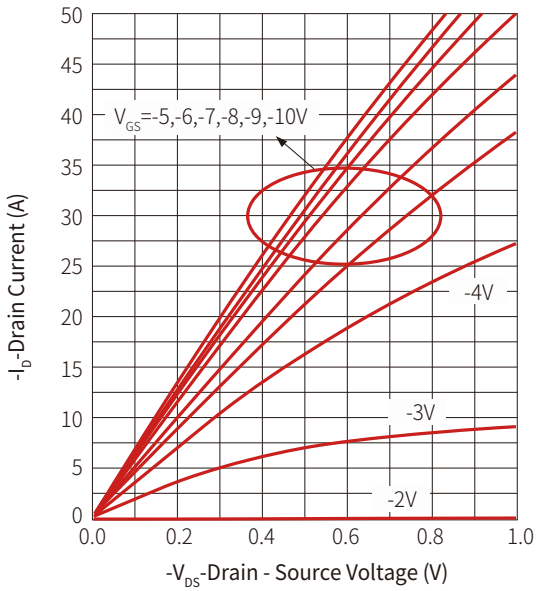


Figure 6: Drain-Source On Resistance

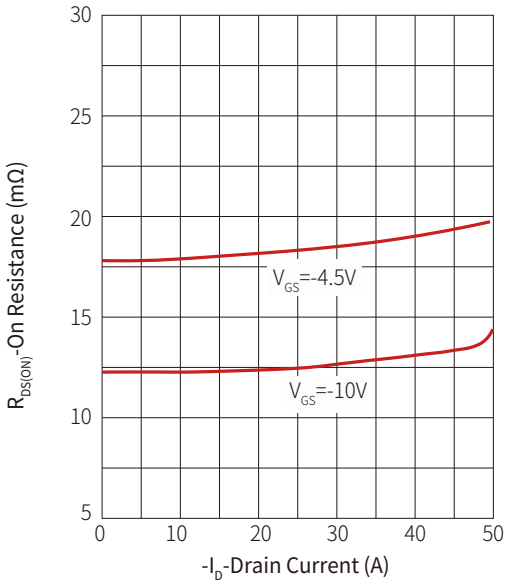


Figure 7:Transfer Characteristics

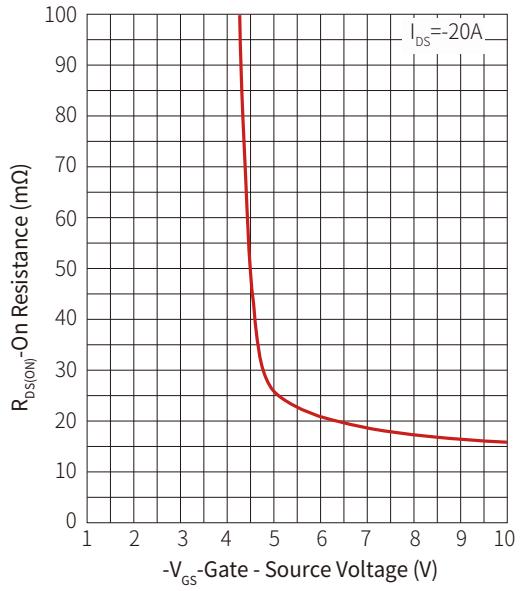


Figure 8: Normalized Threshold Voltage

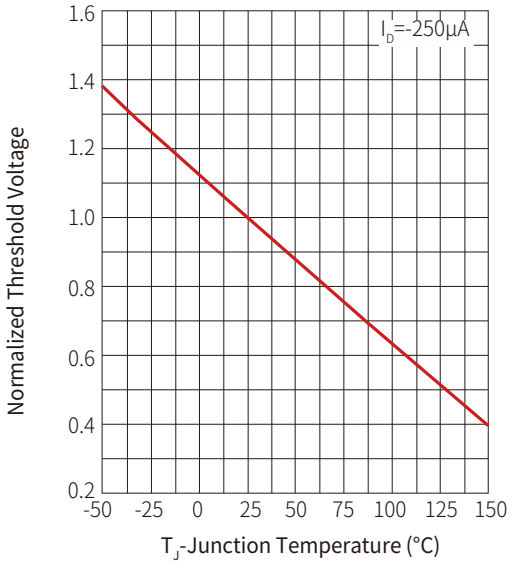


Figure 9:Normalized On Resistance

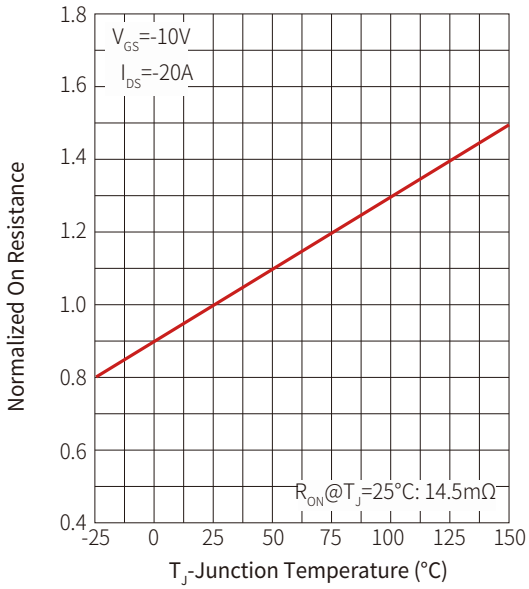


Figure 10: Diode Forward Current

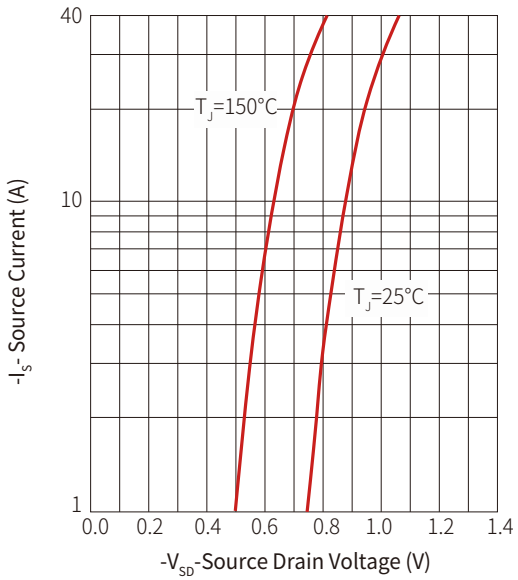


Figure 11:Capacitance

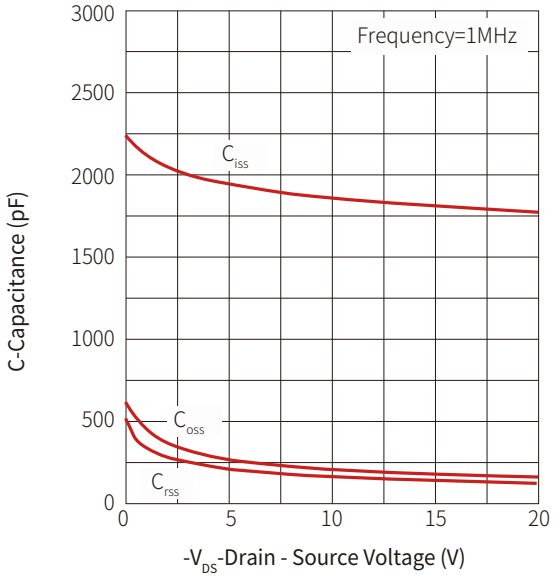
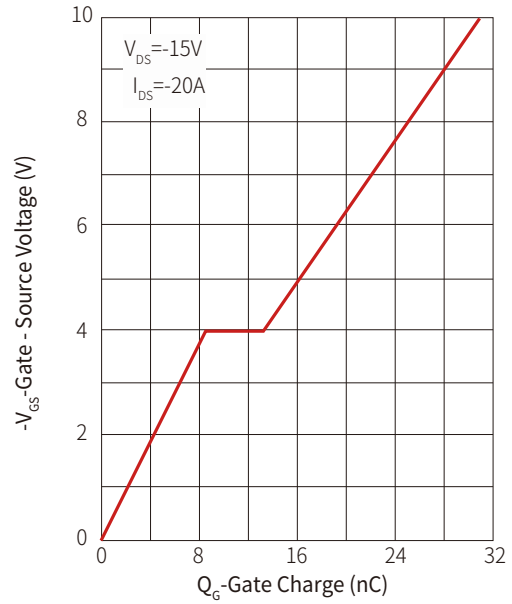
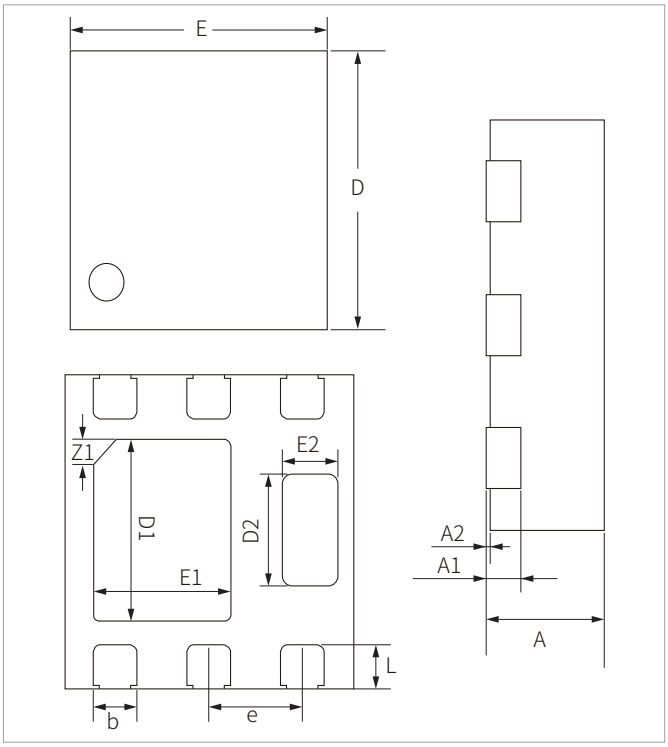


Figure 12: Gate Charge



DFN2020-6L PACKAGE INFORMATION



Ref.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D	1.95	2.00	2.07	0.077	0.079	0.081
E	1.95	2.00	2.07	0.077	0.079	0.081
D1	0.90	1.10	1.20	0.035	0.043	0.047
E1	0.80	0.90	1.00	0.031	0.035	0.039
D2	0.65	0.75	0.85	0.026	0.030	0.033
E2	0.20	0.30	0.40	0.008	0.012	0.016
L	0.20	0.25	0.35	0.008	0.010	0.014
b	0.20	0.27	0.35	0.008	0.011	0.014
e	0.65BSC			0.026BSC		
A	0.70	0.75	0.80	0.028	0.030	0.031
A1	0.18	0.20	0.25	0.007	0.008	0.010
A2	NA	0.02	0.05	NA	0.001	0.002
Z1	0.20	0.25	0.30	0.008	0.010	0.012

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SPM12P02N2	DFN2020-6L	3000PCS	7”

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