

FEATURES

$V_{DS} = -12V, I_D = -8A$

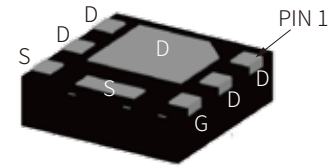
$R_{DS(ON)} (Typ.) = 23m\Omega @ V_{GS} = -4.5V$

$R_{DS(ON)} (Typ.) = 32m\Omega @ V_{GS} = -2.5V$

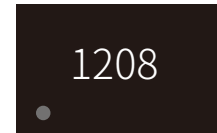
High power and current handling capability

Lead free product is acquired

Surface mount package



DFN2020-6L

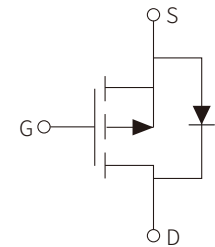


Marking

APPLICATION

PWM applications

Load switch



Schematic Symbol

APPROVALS

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

ABSOLUTE MAXIMUM RATINGS($T_a = 25^\circ C$)

Parameter		Symbol	Value	Unit
Drain-source voltage		V_{DS}	-12	V
Gate-source voltage		V_{GS}	± 12	V
Drain current-continuous	$T_c = 25^\circ C$	I_D	-8 ^a	A
	$T_c = 70^\circ C$		-8 ^a	A
	$T_A = 25^\circ C$		-8 ^{a,b,c}	A
	$T_A = 70^\circ C$		-6 ^{b,c}	A
Drain-source Diode forward current	$T_c = 25^\circ C$	I_S	-8 ^a	A
	$T_A = 25^\circ C$		-2.9 ^{b,c}	A
Drain current-continuous	$T_c = 25^\circ C$	P_D	18	W
	$T_c = 70^\circ C$		12	W
	$T_A = 25^\circ C$		3.5 ^{b,c}	W
	$T_A = 70^\circ C$		2.2 ^{b,c}	W
Operating junction Temperature range		T_J	-55 to 150	$^\circ C$
Maximum junction-to-ambient ^{b,d} $t \leq 5s$		R_{thJA}	36	$^\circ C/W$
Maximum junction-to-case (drain) Steady state		R_{thJC}	6.5	$^\circ C/W$

a. Package limited; b. Surface mounted on 1" x 1" FR4 board
c. $t = 5s$; d. Maximum under steady state conditions is $80^\circ C/W$

ELECTRICAL CHARACTERISTICS (T_A=25°C)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-12	-16.5		V
Gate-body leakage	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$			± 100	nA
Zero gate voltage drain current	I_{DSS}	$V_{DS}=-12V, V_{GS}=0V$			-1	uA
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.40	-0.65	-1	V
Drain-source on-state resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-8A$		23	35	mΩ
		$V_{GS}=-2.5V, I_D=-6A$		32	45	mΩ
Forward transconductance	g_{fs}	$V_{GS}=-10V, I_D=-6.7A$		30		S
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=-6V,$ $f=1.0MHz$		1153		pF
Output capacitance	C_{oss}			233		pF
Reverse transfer capacitance	C_{rss}			211		pF
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS}=-6V, V_{GS}=-4.5V, I_D=-4A$		15		nC
Gate-Source Charge	Q_{gs}			1.62		nC
Gate-Drain Charge	Q_{gd}			5.33		nC
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=-6V, V_{GEN}=-4.5V$ $I_D=-4A, R_L=1.2\Omega$ $R_{GEN}=1\Omega$		13		ns
Turn-on Rise Time	t_r			36		ns
Turn-Off Delay Time	$t_{d(off)}$			32		ns
Turn-Off Fall Time	t_f			12		ns
Drain Source Body Diode Characteristics						
Source Drain Diode Forward Voltage	V_{SD}	$I_S=-1.25A, V_{GS}=0V$		-0.81	-1.2	V

Notes:

- 1.Pulse Test:Pulse Width $\leq 300\mu s$,Duty Cycle $\leq 2\%$.
- 2.Dynamic parameters cannot be verified
- 3.Surface Mounted on FR4 Board, $t \leq 10$ sec

PARAMETER CHARACTERISTIC CURVE

Figure 1: Output Characteristics

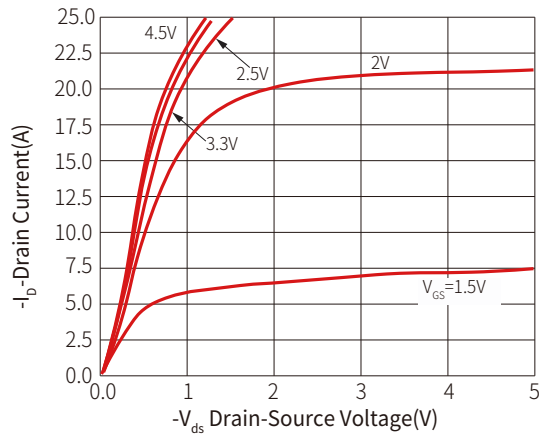


Figure 2: Transfer Characteristics

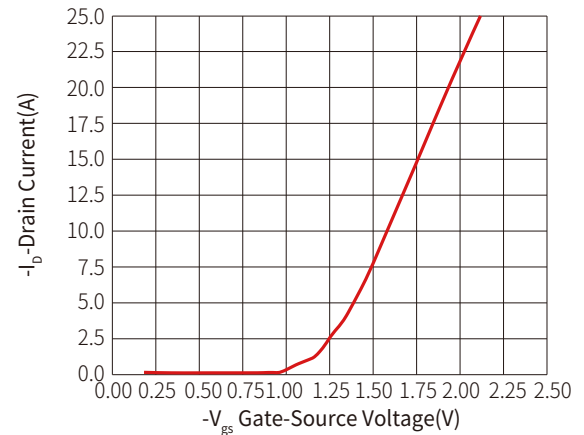


Figure 3: $R_{DS(on)}$ -Drain current

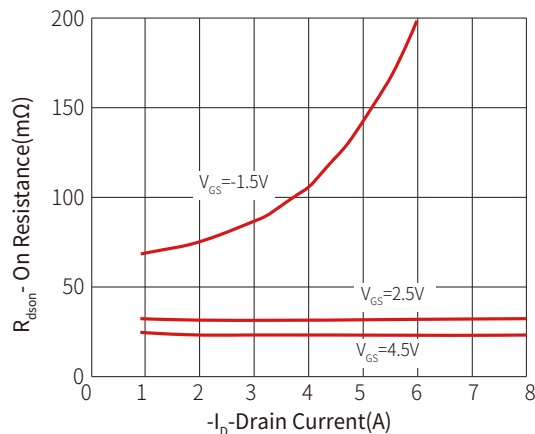


Figure 4: Capacitance vs V_{DS}

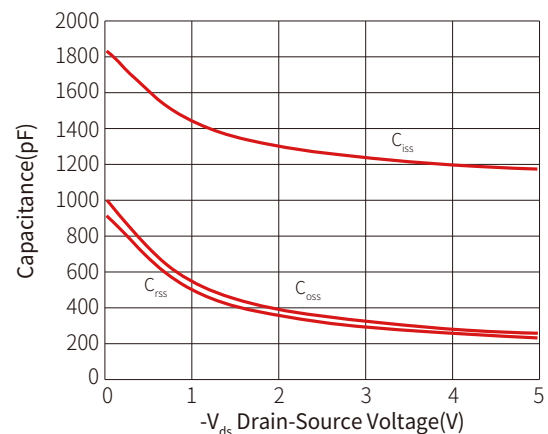


Figure 5: Source-Drain Diode Forward

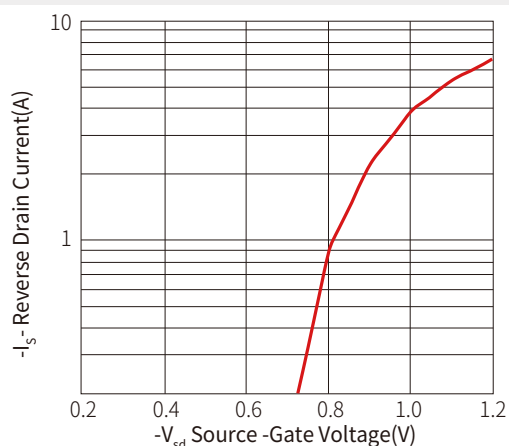


Figure 6: Power De-rating

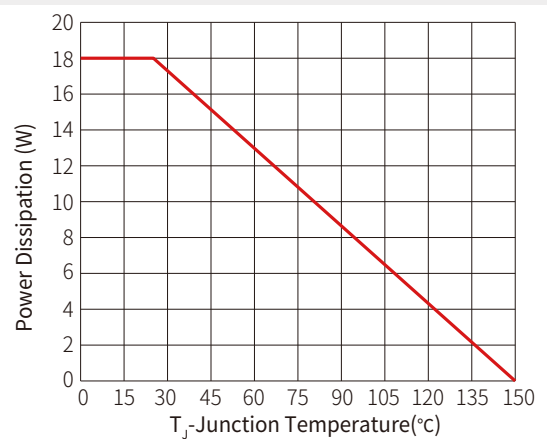
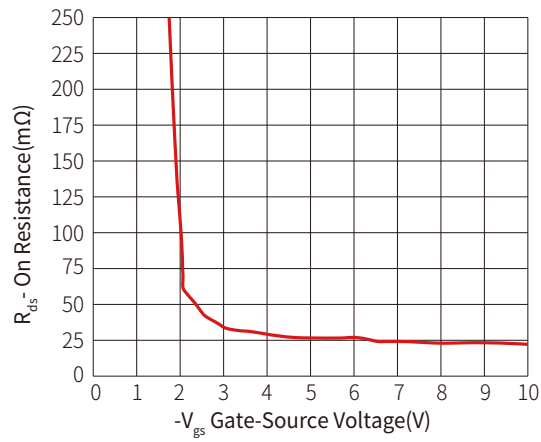
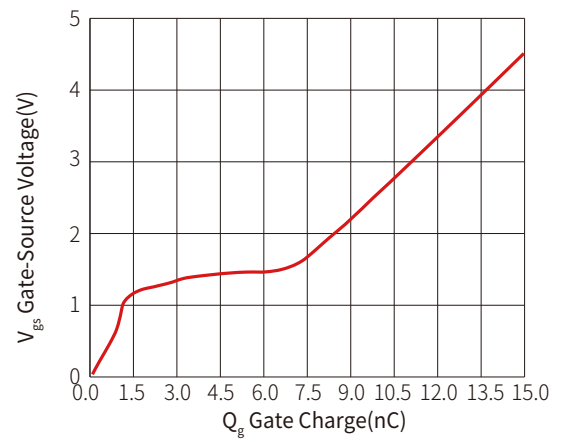
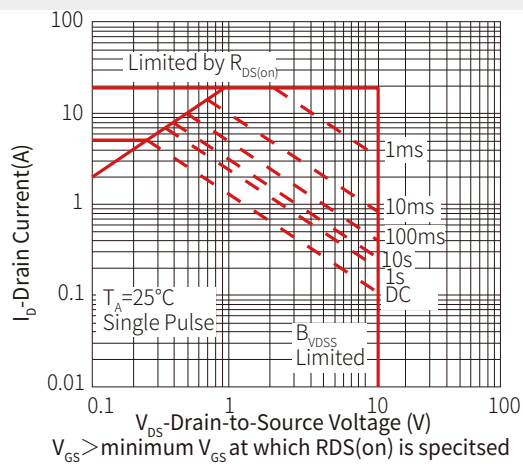
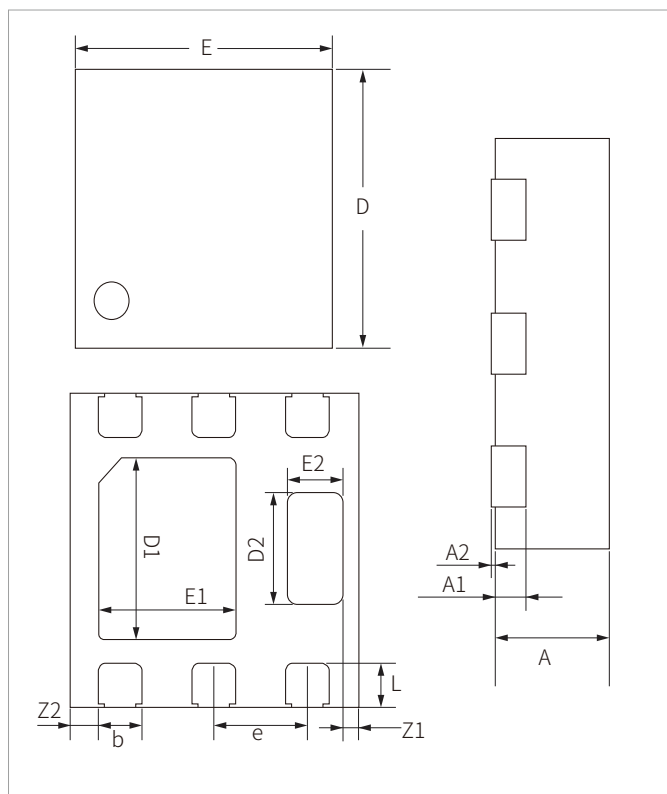


Figure 7: Rdson-Gate Drain voltage

Figure 8: Gate Charge

Figure 9: Safe Operation Area


DFN2020-6L PACKAGE INFORMATION



Ref.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
D	1.95	2.00	2.05	0.077	0.079	0.081
E	1.95	2.00	2.05	0.077	0.079	0.081
D1	1.10	1.15	1.20	0.043	0.045	0.047
E1	0.90	0.95	1.00	0.035	0.037	0.039
D2	0.65	0.70	0.75	0.026	0.028	0.030
E2	0.33	0.38	0.43	0.013	0.015	0.017
L	0.23	0.275	0.33	0.009	0.011	0.013
b	0.25	0.30	0.35	0.010	0.012	0.014
e	0.65BSC			0.026BSC		
A	0.40	0.50	0.60	0.016	0.020	0.024
A1	0.150REF			0.006REF		
A2	0.00	-	0.05	0.00	-	0.002
Z1	0.06	0.11	0.16	0.002	0.004	0.006
Z2	0.15	0.20	0.25	0.006	0.008	0.010

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SPM1208	DFN2020-6L	3000PCS	7"

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