

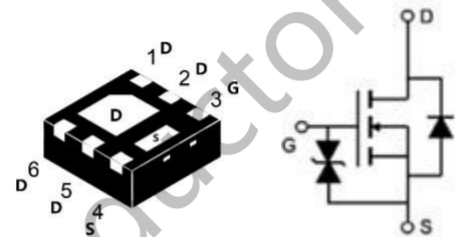
Features

- Low $R_{DS(on)}$ @ $V_{GS}=4.5V$
- 3.3V Logic Level Control
- N Channel DFN2X2-6L Package
- HMB ESD Protection 2KV
- Pb-Free, RoHS Compliant

$V_{(BR)DSS}$	$R_{DS(ON)}$ Typ	I_D Max
20V	13mΩ @ 4.5V	12A
	14mΩ @ 3.3V	

Applications

- DC-to-DC converters
- Power management in battery-driven portables
- Low-side load switch and charging switch for portable devices
- Switching circuits
- High-speed line driver



DFN2X2-6L

Absolute Maximum Ratings

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

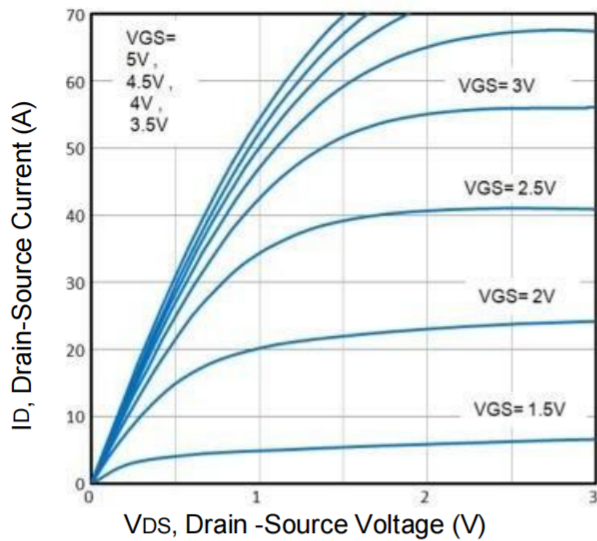
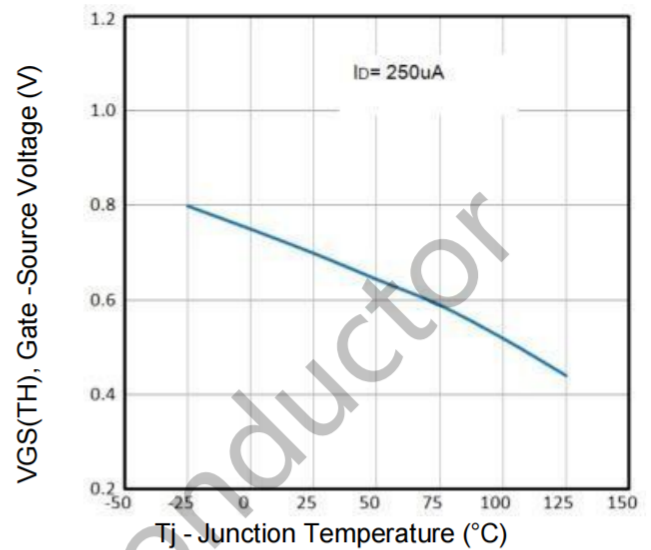
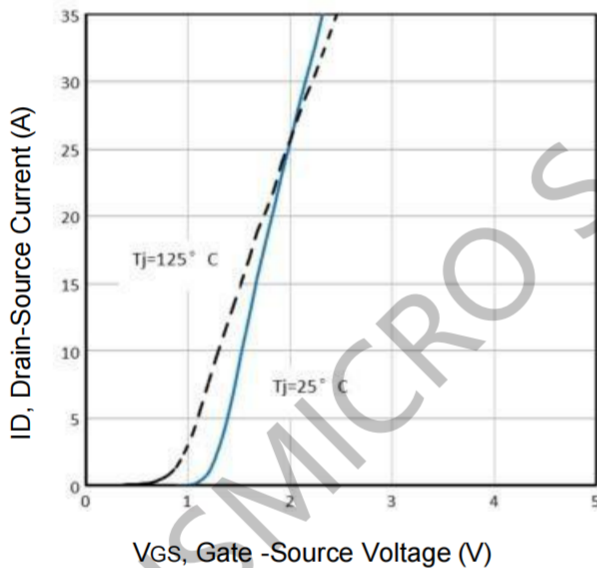
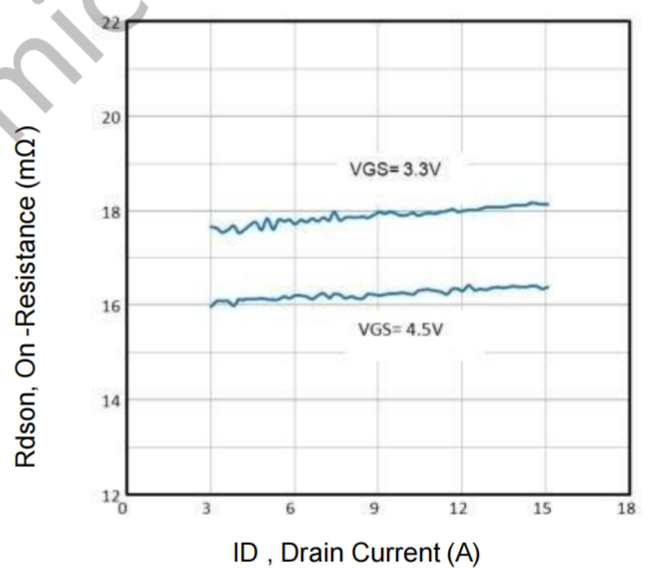
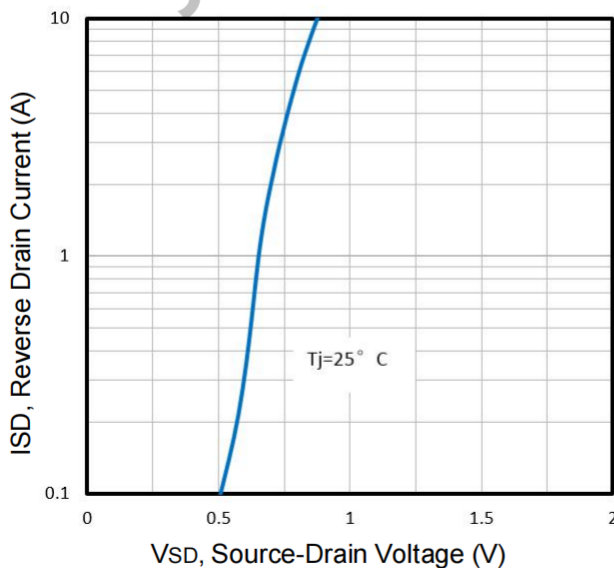
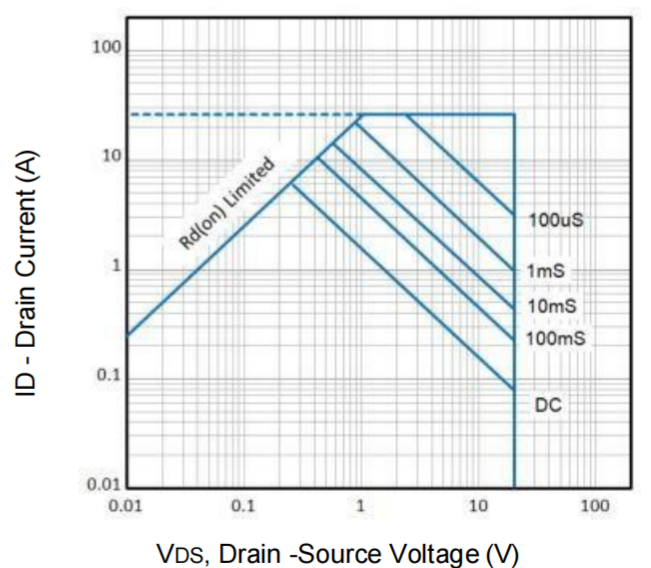
Symbol	Parameter	Rating	Unit	
Common Ratings (TA=25°C Unless Otherwise Noted)				
VGS	Gate-Source Voltage	±8	V	
V(BR)DSS	Drain-Source Breakdown Voltage	20	V	
TJ	Maximum Junction Temperature	150	°C	
TSTG	Storage Temperature Range	-50 to 150	°C	
Mounted on Large Heat Sink				
IDM	Pulse Drain Current Tested①	TA=25°C	26	A
ID	Continuous Drain Current	TA=25°C	12	A
		TA=70°C	10	
PD	Maximum Power Dissipation	TA=25°C	1.56	W
		TA=70°C	0.9	
RθJA	Thermal Resistance Junction-Ambient	80	°C/W	

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	20	–	–	V
I _{DSS}	Zero Gate Voltage Drain Current(T _A =25°C)	V _{DS} =20V, V _{GS} =0V	–	–	1	μA
	Zero Gate Voltage Drain Current(T _A =125°C)	V _{DS} =16V, V _{GS} =0V	–	–	100	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±8V, V _{DS} =0V	–	–	±10	uA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.4	0.7	1.0	V
R _{DS(ON)}	Drain-Source On-State Resistance②	V _{GS} =4.5V, I _D =5A	–	13	17	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance②	V _{GS} =3.3V, I _D =3A	–	14	18	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance②	V _{GS} =2.5V, I _D =2A	–	16	20	mΩ
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =10V, V _{GS} =0V, f=1MHz	–	450	–	pF
C _{oss}	Output Capacitance		–	108	–	pF
C _{rss}	Reverse Transfer Capacitance		–	80	–	pF
Q _g	Total Gate Charge	V _{DS} =10V I _D =5A, V _{GS} =4.5V	–	8.3	–	nC
Q _{gs}	Gate Source Charge		–	1.4	–	nC
Q _{gd}	Gate Drain Charge		–	4.7	–	nC
Switching Characteristics @ T _J = 25°C (unless otherwise stated)						
t _{d(on)}	Turn on Delay Time	V _{DD} =10V, I _D =1A, R _G =3.3Ω, V _{GS} =4.5V	–	285	–	ns
t _r	Turn on Rise Time		–	345	–	ns
t _{d(off)}	Turn Off Delay Time		–	5.8	–	ns
t _f	Turn Off Fall Time		–	4.2	–	ns
Source Drain Diode Characteristics @ T _J = 25°C (unless otherwise stated)						
I _{SD}	Source drain current(Body Diode)	T _A =25°C	–	–	12	A
V _{SD}	Forward on voltage②	T _J =25°C, I _{SD} =5A, V _{GS} =0V	–	0.78	1.2	V

Notes:

① Pulse width limited by maximum allowable junction temperature

② Pulse test ; Pulse width≤300μs, duty cycle≤2%.


Fig1. Typical Output Characteristics

Fig2. VGS(TH) Voltage Vs. Temperature

Fig3. Typical Transfer Characteristics

Fig4. On-Resistance vs. Drain Current and Gate

Fig5. Typical Source-Drain Diode Forward Voltage

Fig6. Maximum Safe Operating Area

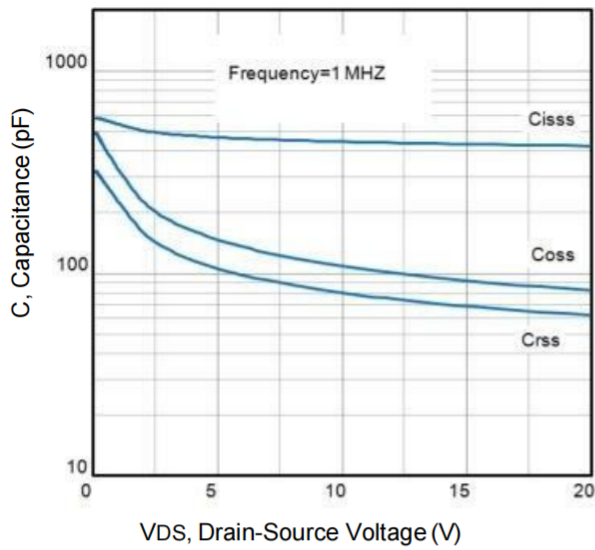


Fig7. Typical Capacitance Vs. Drain-Source Voltage

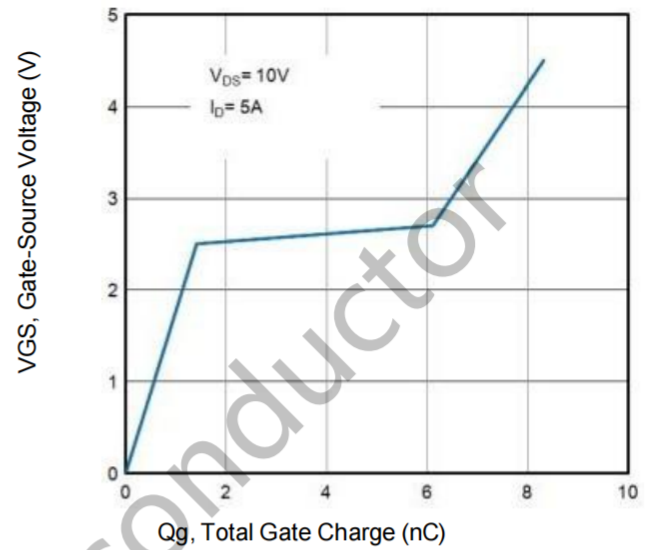


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

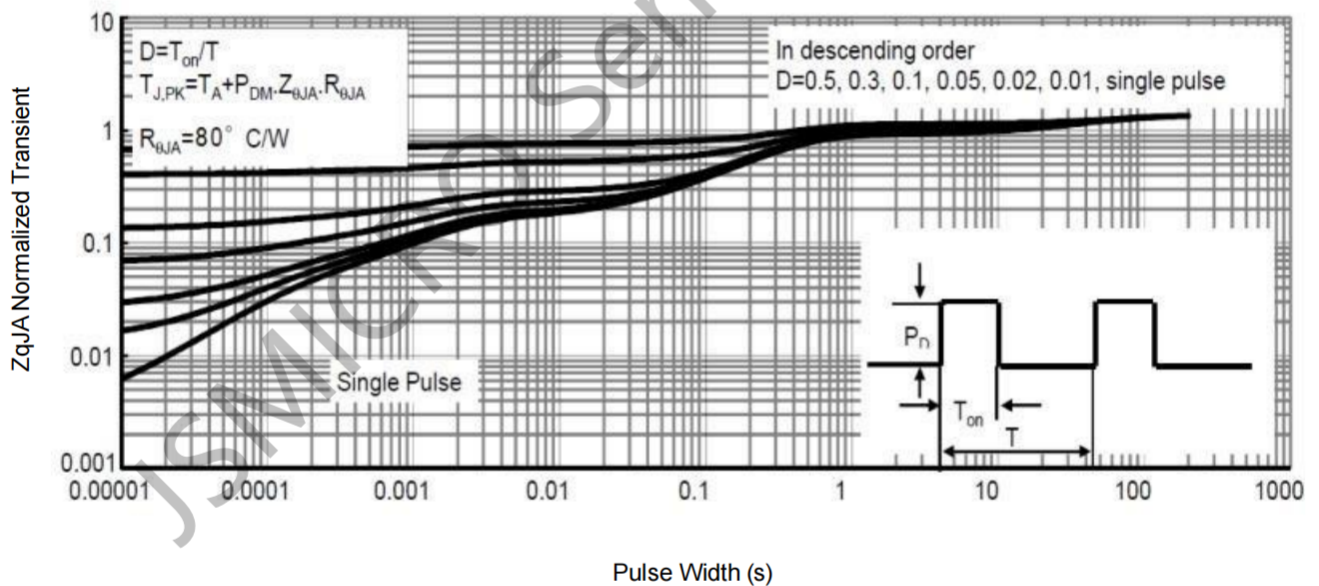


Fig9. Normalized Maximum Transient Thermal Impedance

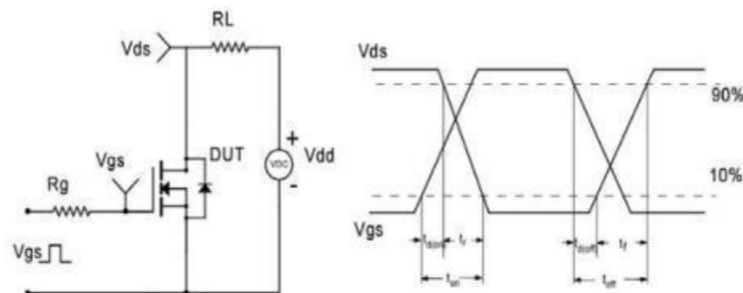
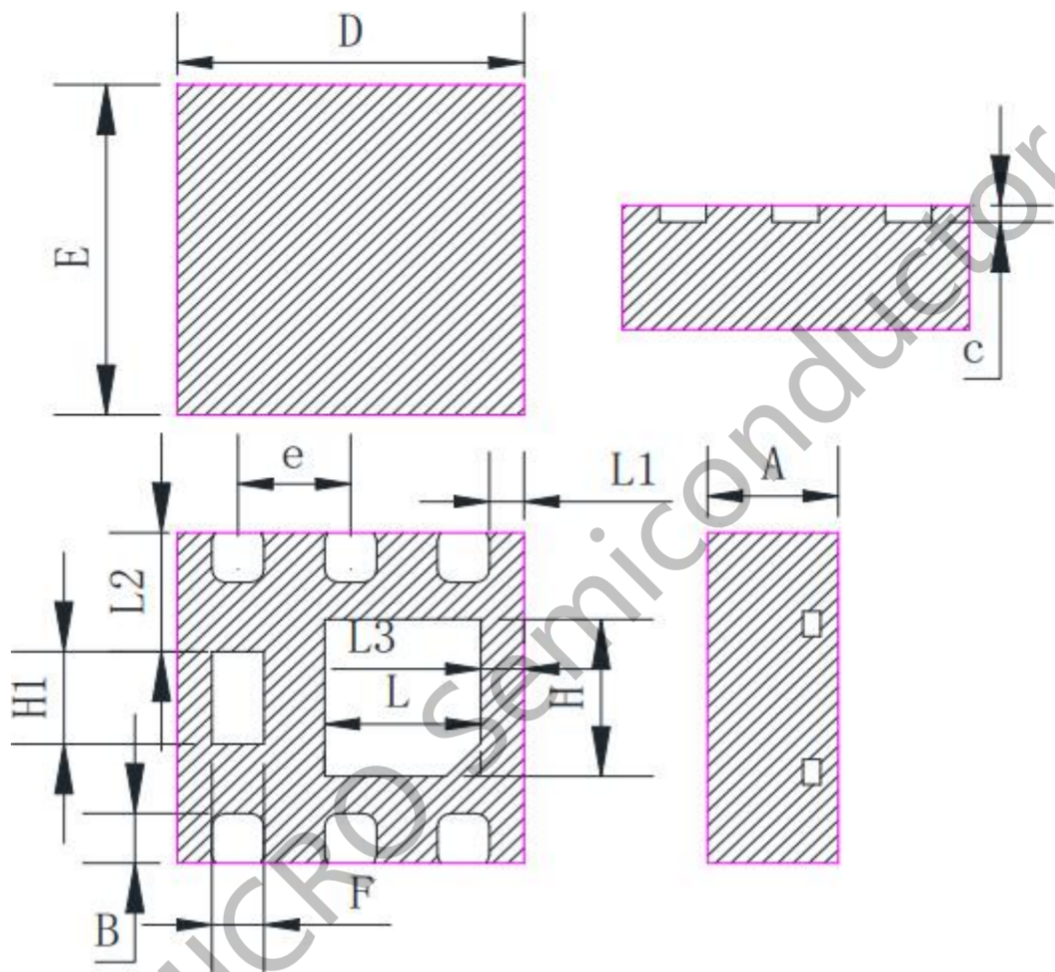


Fig10. Switching Time Test Circuit and waveforms

DFN2X2-6L Mechanical Data



DIMENSIONS(unit:mm)

Symbol	Min	Typ	Max
A	0.70	0.75	0.80
B	0.25	0.30	0.35
C	0.153	0.203	0.253
D	1.90	2.00	2.10
E	1.90	2.00	2.10
e	0.60	0.65	0.70
F	0.25	0.30	0.35
H	0.85	0.95	1.05
H1	0.51	0.56	0.61
L	0.80	0.90	1.00
L1	0.15	0.20	0.25
L2	0.62	0.72	0.82
L3	0.25	0.30	0.35