# N-Channel Enhancement Mode MOSFET

Features

- High Speed Power Switching
- Reliable and Rugged
- ROHS Compliant
- 100% Avalanche Tested
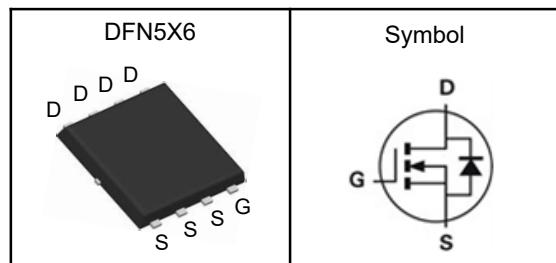
Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description

DFN5X6	Symbol

V_{DSS}	100	V
$R_{DS(ON)-Typ}$	12	mΩ
I_D	41	A

Absolute Maximum Ratings(T$_C$=25℃, Unless Otherwise Noted)

Symbol	Parameter	N-Channel	Unit
V_{DSS}	Drain-Source Voltage	100	V
V_{GSS}	Gate-Source Voltage	±20	V
T_J	Maximum Junction Temperature	-55 to 150	℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
I_{DM}[①]	Pulse Drain Current Tested	71	A
I_D	Continuous Drain Current	41	A
P_D	Maximum Power Dissipation	46	W
E_{AS}	Avalanche Energy, Single pulse	5	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{θJA}$	Thermal Resistance-Junction to Ambient	50	℃/W
$R_{θJC}$	Thermal Resistance-Junction to Case	2.7	℃/W

Note ① : Max. current is limited by bonding wire.

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150℃.

Note ③ : Surface Mounted on 1in^2 FR-4 board with 1oz.

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Electrical Characteristics (T$_J$=25℃, Unless Otherwise Noted)

| Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV$_{DSS}$	Drain-Source Breakdown Voltage	V$_{GS}$=0V, I$_D$=250uA	100	---	---	V
I$_{DSS}$	Zero Gate Voltage Drain Current	V$_{DS}$=80V, V$_{GS}$=0V	---	---	1	uA
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$, I$_D$=250uA	1	---	3	V
I$_{GSS}$	Gate Leakage Current	V$_{GS}$=±20V, V$_{DS}$=0V	---	---	±100	nA
R$_{DS(ON)}$	Drain-Source On-state Resistance	V$_{GS}$=10V, I$_D$=12A	---	12	15	mΩ
		V$_{GS}$=4.5V, I$_D$=8A	---	19	25	mΩ
Dynamic Characteristics[5]						
gfs	Forward Transconductance	V$_{DS}$=5V , I$_D$=20A	---	22	---	S
R$_g$	Gate Resistance	V$_{DS}$=0V , V$_{GS}$=0V , f=1MHz	---	3	---	Ω
C$_{iss}$	Input Capacitance	V$_{DS}$=50V, V$_{GS}$=0V, Freq.=1MHz	---	1055	---	pF
C$_{oss}$	Output Capacitance		---	182	---	
C$_{rss}$	Reverse Transfer Capacitance		---	5	---	
T$_{d(on)}$	Turn-on Delay Time	V$_{DS}$=50V,V$_{GS}$=10V, I$_D$=1A,R$_G$=3Ω	---	6	---	nS
T$_r$	Turn-on Rise Time		---	15	---	
T$_{d(off)}$	Turn-off Delay Time		---	16	---	
T$_f$	Turn-off Fall Time		---	25	---	
Q$_g$	Total Gate Charge	V$_{DS}$=50V,V$_{GS}$=10V, I$_D$=12A	---	22.5	---	nC
Q$_{gs}$	Gate-Source Charge		---	3.2	---	
Q$_{gd}$	Gate-Drain Charge		---	7.6	---	
Source-Drain Characteristics						
V$_{SD}$	Diode Forward Voltage	I$_S$=20A, V$_{GS}$=0V	---	---	1.1	V
t$_{rr}$	Reverse Recovery Time	I$_F$=20A,V$_R$=50V, dI$_F$/dt=100A/us	---	40	---	nS
Q$_{rr}$	Reverse Recovery Charge		---	59	---	nC

Note ④： Pulse test (pulse width≤300us, duty cycle≤2%).

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

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Typical Characteristics
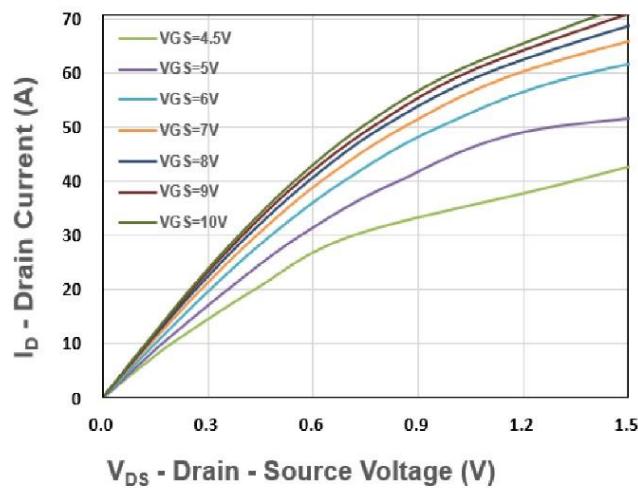
Figure 1. Output Characteristics
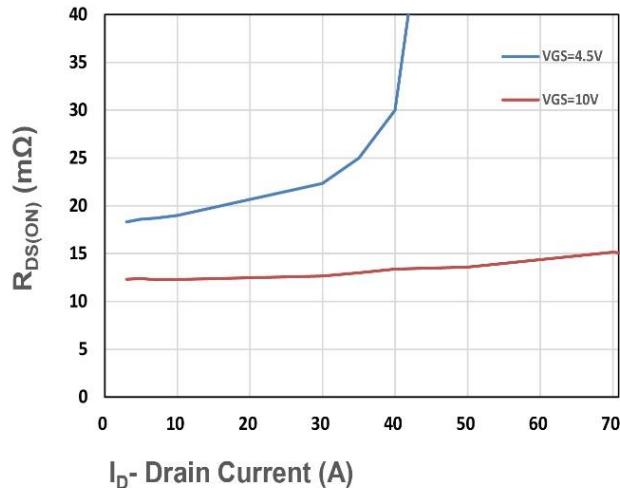
Figure 2. On-Resistance vs. ID
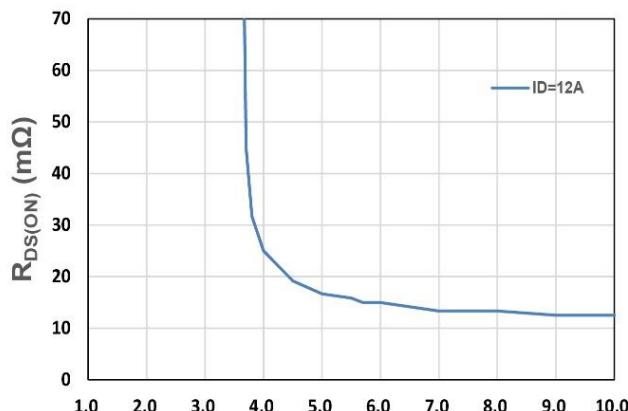
Figure 3. On-Resistance vs. VGS
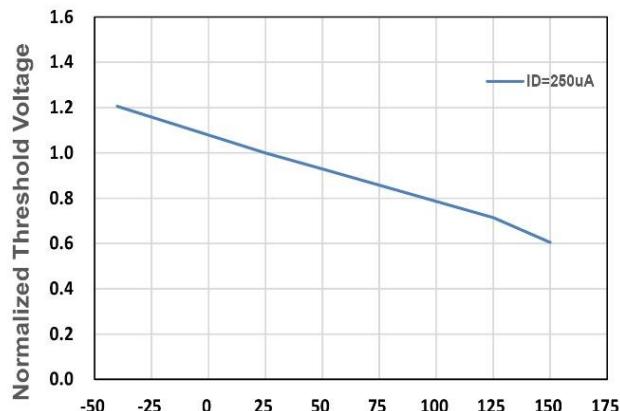
Figure 4. Gate Threshold Voltage
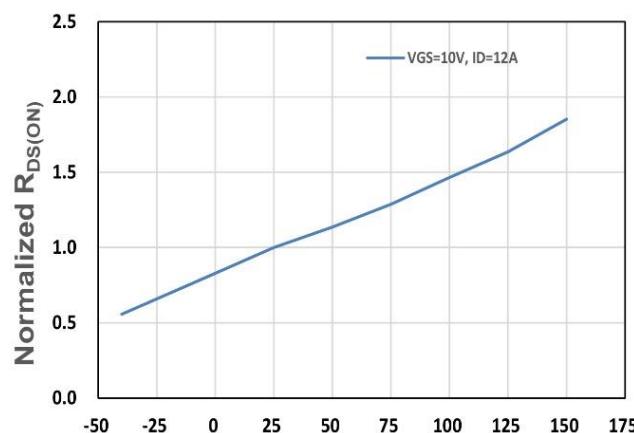
Figure 5. Drain-Source On Resistance
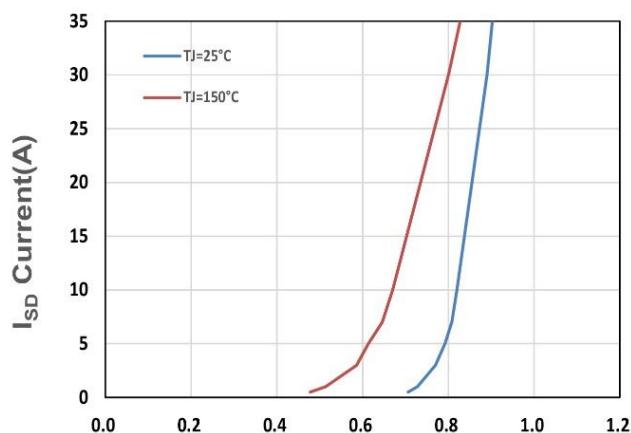
Figure 6. Source-Drain Diode Forward

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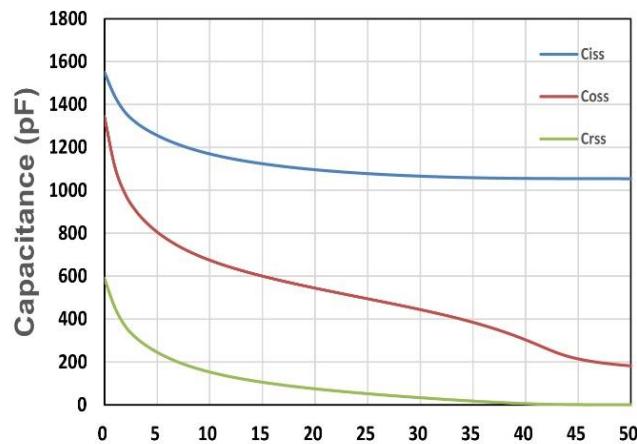
Figure 7. Capacitance
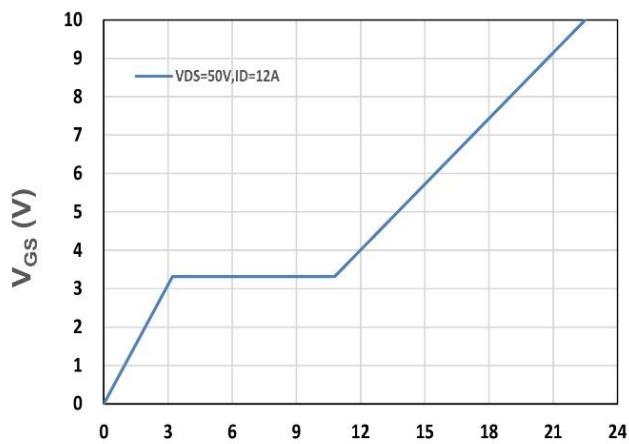
Figure 8. Gate Charge Characteristics
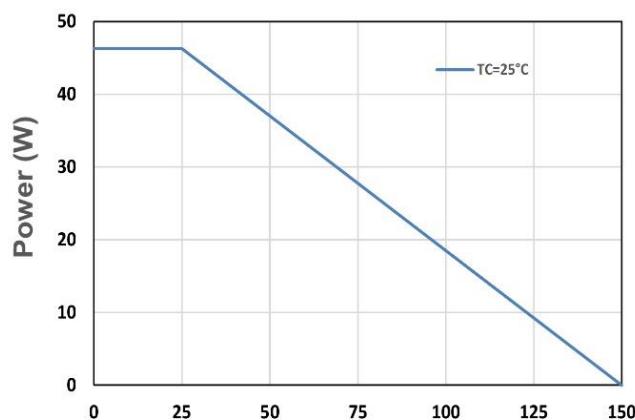
Figure 9. Power Dissipation
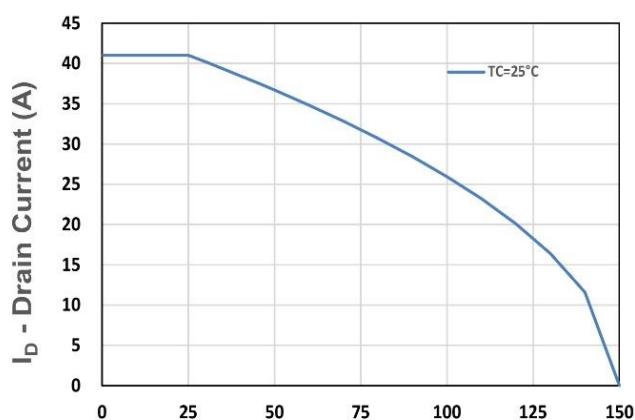
Figure 10. Drain Current
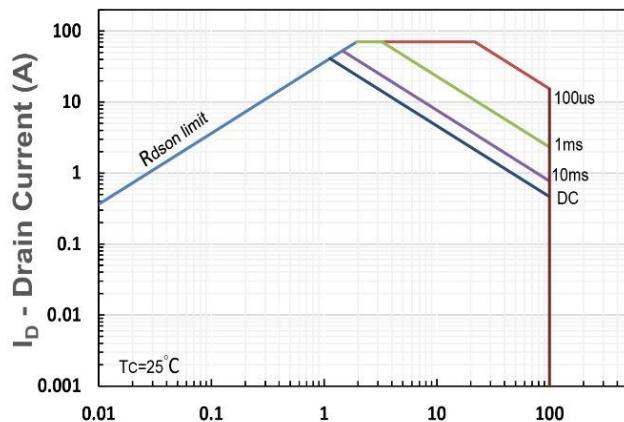
Figure 11. Safe Operating Area
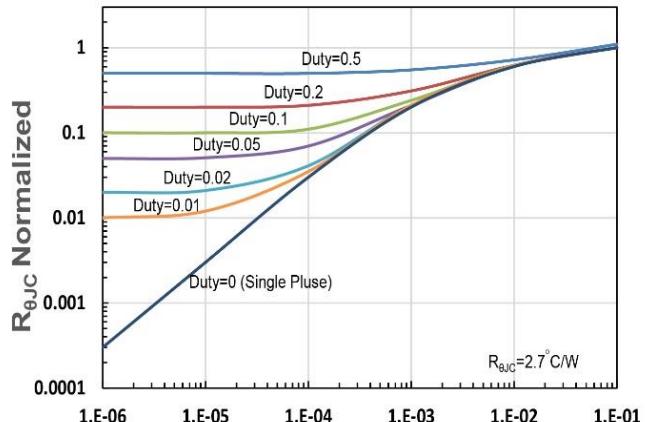
Figure 12. RθJC Transient Thermal Impedance

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DFN5X6-8L Package Outline Dimensions

BOTTOM VIEW

VIEW 'A'
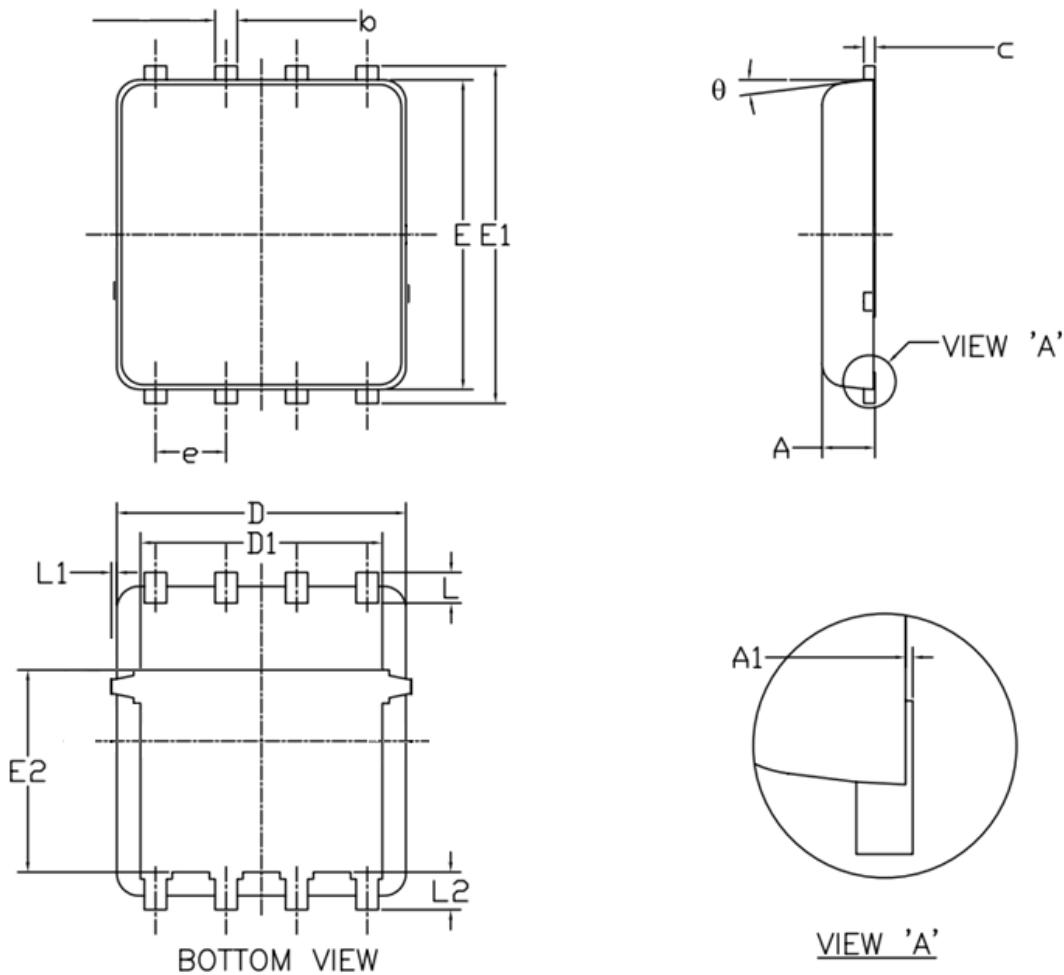
Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	0.90	1.00	1.20	E1	5.90	6.10	6.35
A1	0.00	--	0.05	E2	3.38	3.58	3.92
b	0.30	0.40	0.51	e	1.27 BSC		
c	0.20	0.25	0.33	L	0.51	0.61	0.71
D	4.80	4.90	5.40	L1	--	--	0.15
D1	3.61	4.00	4.25	L2	0.41	0.51	0.61
E	5.65	5.80	6.06	θ	0°	--	12°