

N-Channel Enhancement Mode MOSFET

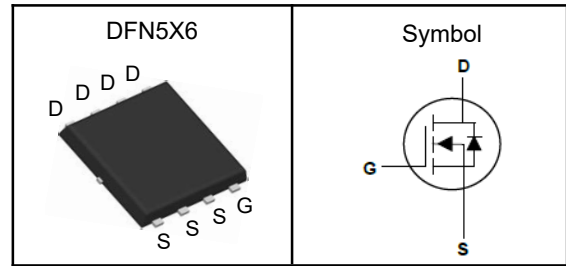
Features

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant
- 100% UIS and Rg Tested

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



V_{DSS}	60	V
$R_{DS(ON)-Typ}$	2.6	m Ω
I_D	107	A

Absolute Maximum Ratings ($T_J=25^\circ\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	60	V
V_{GSS}	Gate-Source Voltage	± 20	V
T_J	Maximum Junction Temperature	-55 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
E_{AS}	Single Pulse Avalanche Energy ³	650	mJ
$I_{DM}^{①}$	Pulse Drain Current Tested	240	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$	A
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	65	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ₁	2	$^\circ\text{C}/\text{W}$

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

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150 $^\circ\text{C}$.

Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.



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Electrical Characteristics (T_J=25°C, 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	60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V	---	---	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1.0	---	2.5	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 =20A	---	2.6	3.3	mΩ
		V _{GS} =4.5V, I _D =10A	---	3.2	4.5	mΩ
Dynamic Characteristics ⑤						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, Freq.=1MHz	---	4080	---	pF
C _{oss}	Output Capacitance		---	1020	---	
C _{rss}	Reverse Transfer Capacitance		---	41	---	
T _{d(on)}	Turn-on Delay Time	V _{DD} =30V, I _D =40A, V _{GS} =10V, R _G =3Ω	---	8.7	---	nS
T _r	Turn-on Rise Time		---	5.8	---	
T _{d(off)}	Turn-off Delay Time		---	28	---	
T _f	Turn-off Fall Time		---	6.4	---	
Q _g	Total Gate Charge	V _{DS} =30V, V _{GS} =10V, I _D =20A	---	42	---	nC
Q _{gs}	Gate-Source Charge		---	10	---	
Q _{gd}	Gate-Drain Charge		---	12	---	
Source-Drain Characteristics (T _J =25°C)						
V _{SD}	Diode Forward Voltage _z	V _{GS} =0V, I _S =1A, T _J =25°C	---	0.7	1.2	V
t _{rr}	Reverse Recovery Time	V _R =30V, I _F =20 A, di/dt=100A/μs, T _J =25°C	---	35	---	nS
Q _{rr}	Reverse Recovery Charge		---	30	---	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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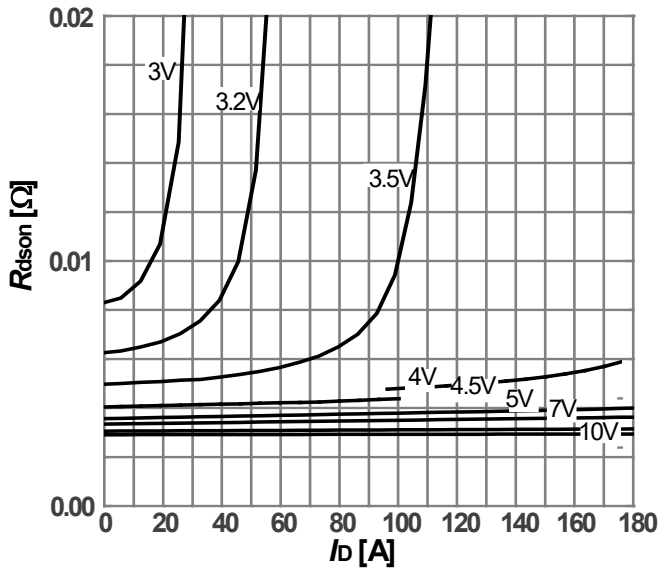


Diagram 1: On-state resistance vs. Drain current

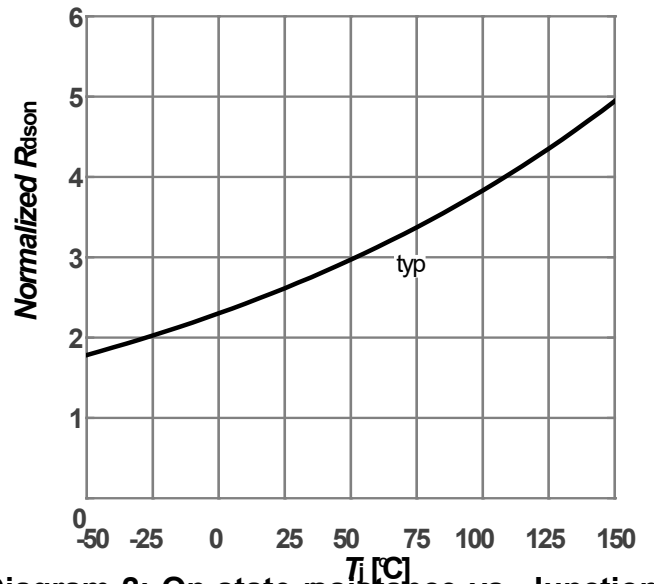


Diagram 2: On-state resistance vs. Junction temperature

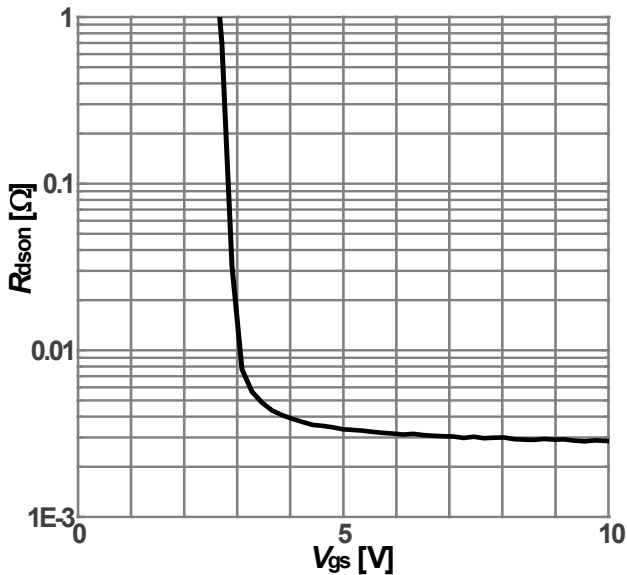


Diagram 3: On-state resistance vs. Vgs characteristics

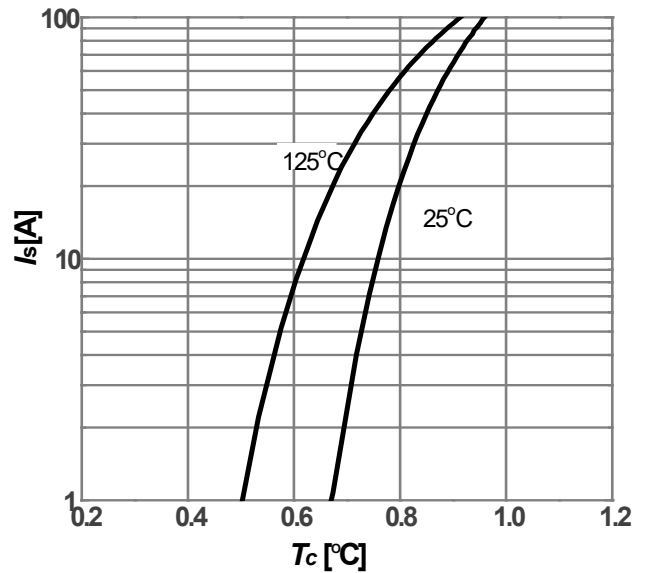


Diagram 4: Forward characteristics of reverse diode

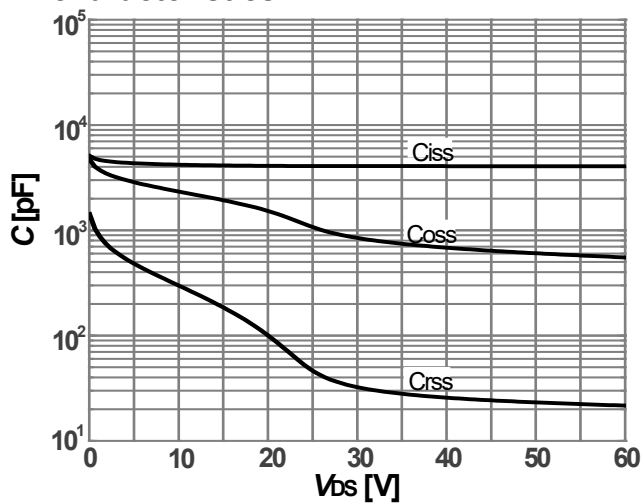


Diagram 5: Typ. capacitances

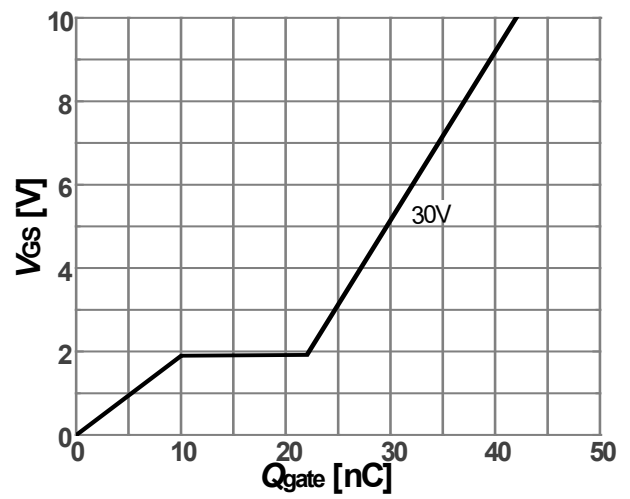


Diagram 6: Typ. gate charge

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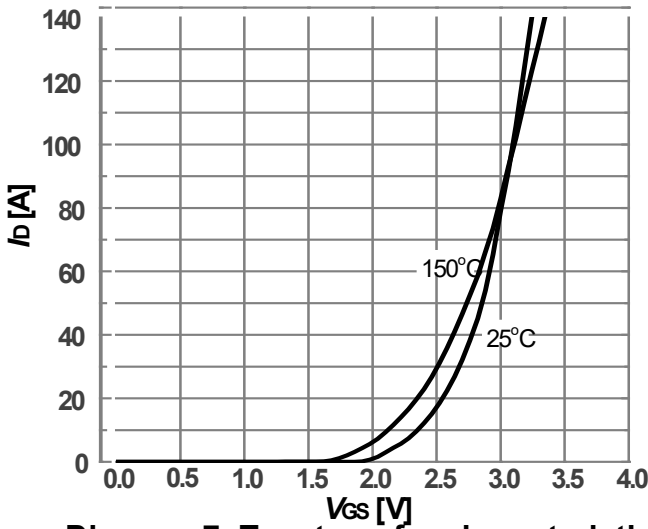


Diagram 7: Typ. transfer characteristics

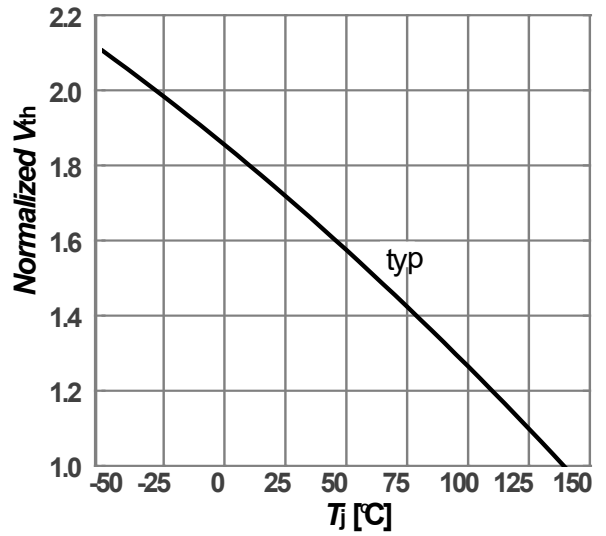


Diagram 8: Gate threshold voltage vs. Junction temperature

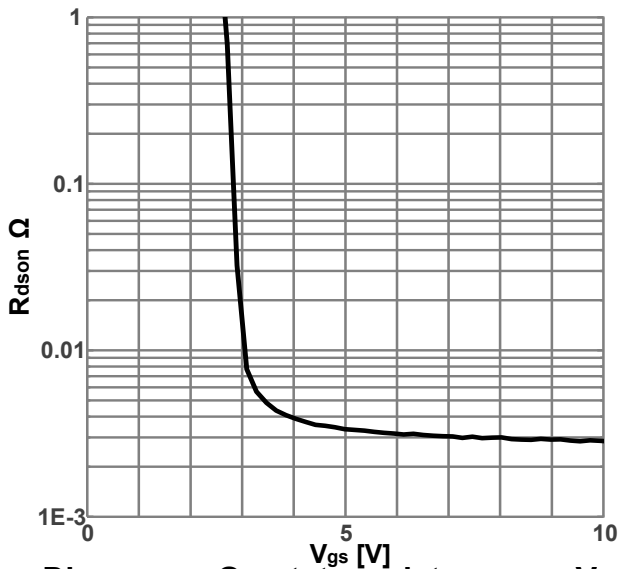


Diagram 9: On-state resistance vs. Vgs characteristics

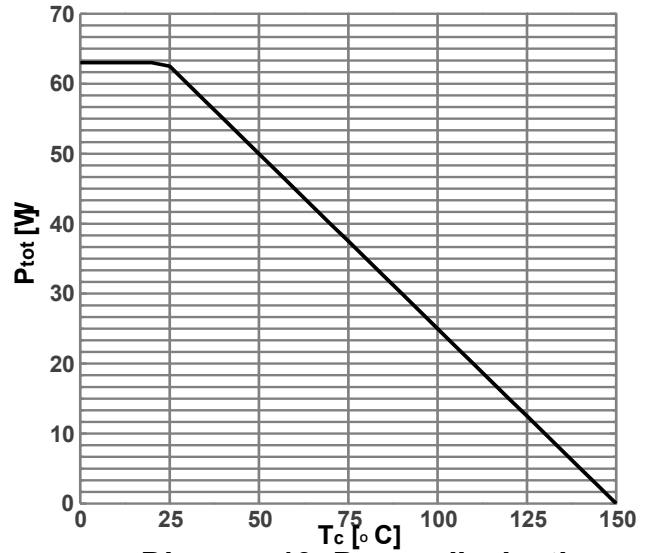


Diagram 10: Power dissipation

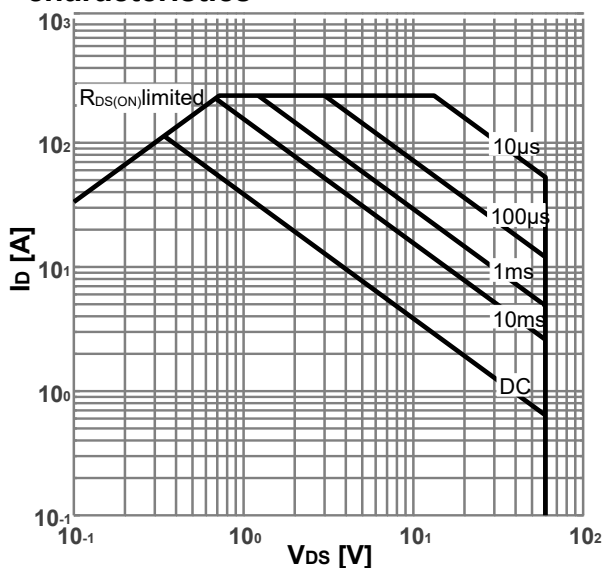


Diagram 11: Safe operating area

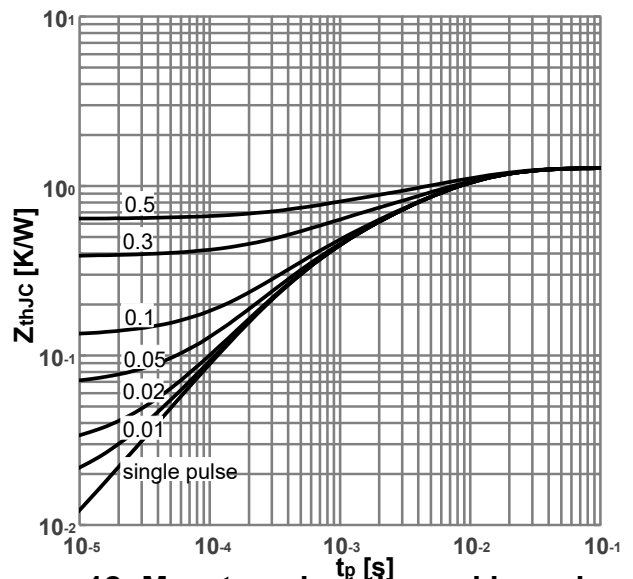
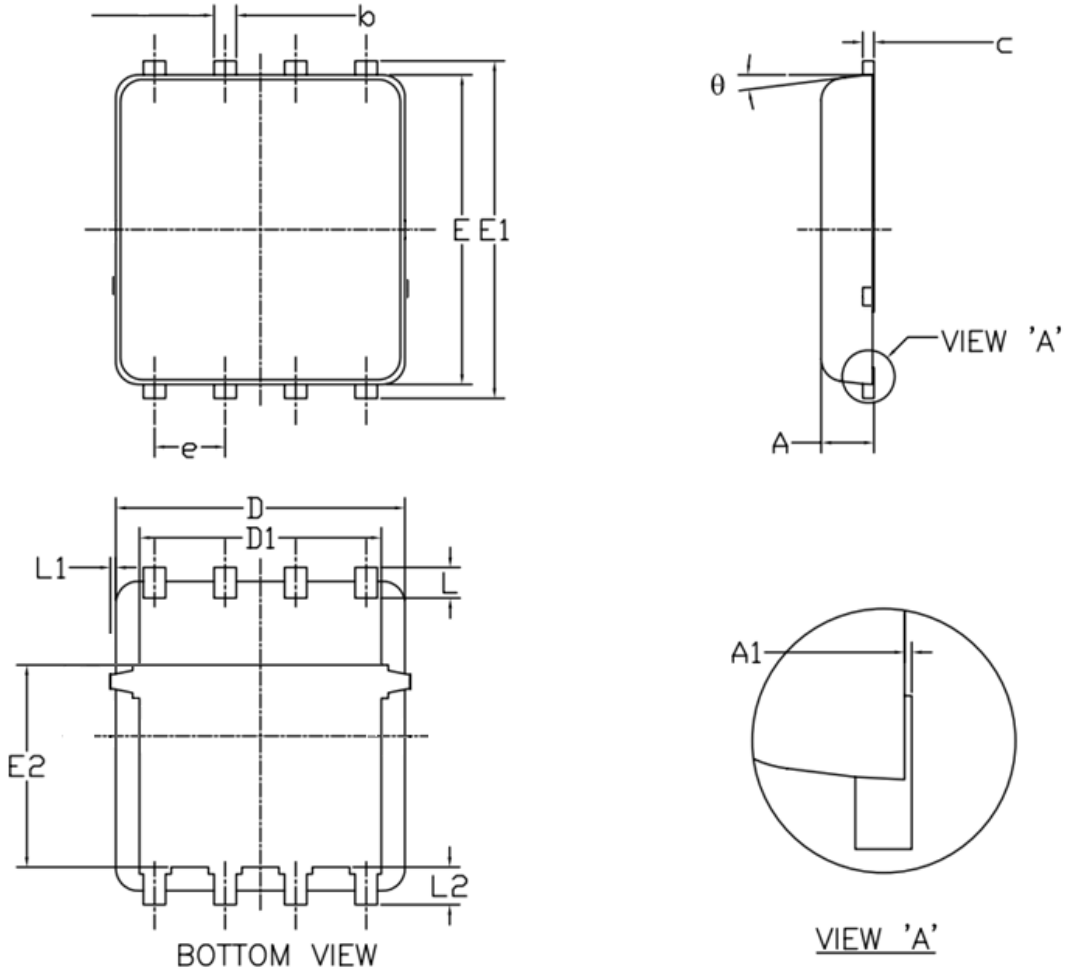


Diagram 12: Max. transient thermal impedance

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DFN5X6-8L Package Outline Dimensions


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	theta	0°	--	12°