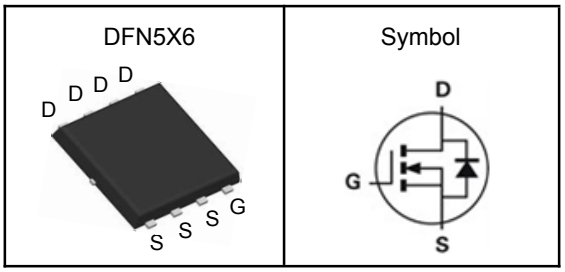
N-Channel Enhancement Mode MOSFET

Features

- Low Rdson for low conduction loss
- Reliable and Rugged
- ROHS Compliant & Halogen-Free

Pin Description



Applications

- Power Management in Desktop Computer
- DC/DC Converters

V_{DSS}	40	V
$R_{DS(ON)-Typ}$	1.45	mΩ
I_D	188	A

Absolute Maximum Ratings (T_A=25℃, Unless Otherwise Noted)

Symbol	Parameter		N-Channel	Unit
V_{DSS}	Drain-Source Voltage		40	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	T_C=25°C	400	A
I_D	Continuous Drain Current	T_C=25°C	188	A
		T_C=100°C	119	
P_D	Maximum Power Dissipation	T_C=25°C	96	W
E_{AS} ②	Avalanche Energy, Single pulse L=0.1mH		211	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$ ③	Thermal Resistance-Junction to Ambient （Max）	50	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.3	℃/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 1in² 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	40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=36V, V_{GS}=0V	---	---	1	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250uA	1.0	---	2.0	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	---	1.45	1.7	mΩ
		V_{GS}=4.5V, I_D=15A	---	1.8	2.3	
gfs	Forward Transconductance	V_{DS}=5V , I_D=10A	---	52.3	---	S
Dynamic Characteristics⑤						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=20V, Freq.=1MHz	---	6228	---	pF
C_{oss}	Output Capacitance		---	605	---	
C_{rss}	Reverse Transfer Capacitance		---	453	---	
$T_{d(on)}$	Turn-on Delay Time	V_{DD}=20V , V_{GS}=10V , R_G=6Ω, I_D=1A	---	14.2	---	nS
T_r	Turn-on Rise Time		---	17	---	
$T_{d(off)}$	Turn-off Delay Time		---	347	---	
T_f	Turn-off Fall Time		---	110	---	
Q_g	Total Gate Charge	V_{DS}=20V,V_{GS}=10V, I_D=20A	---	180	---	nC
Q_{gs}	Gate-Source Charge		---	34	---	
Q_{gd}	Gate-Drain Charge		---	26.9	---	
Source-Drain Characteristics						
V_{SD}④	Diode Forward Voltage	V_{GS}=0V , I_S=10A , T_J=25℃	---	0.7	1.1	V
t_{rr}	Reverse Recovery Time	I_F=10A ,V_R=20V di/dt=100A/μs，T_J=25℃	---	32.7	---	nS
Q_{rr}	Reverse Recovery Charge		---	31.9	---	nC

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

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

Typical Characteristics

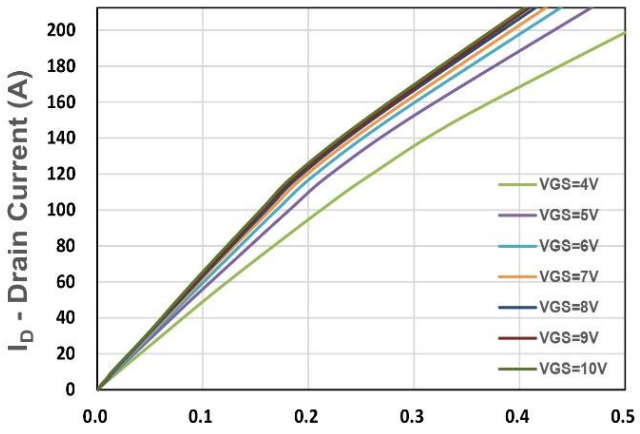

Figure 1. Output Characteristics

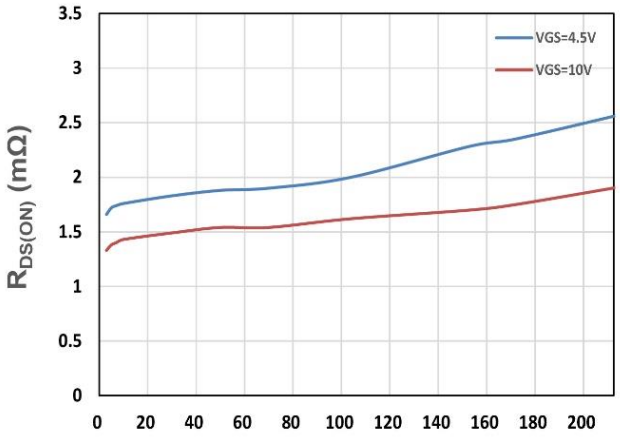

Figure 2. On-Resistance vs. ID

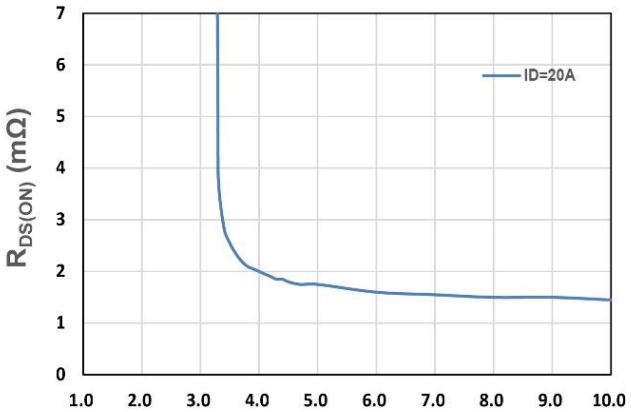

Figure 3. On-Resistance vs. VGS

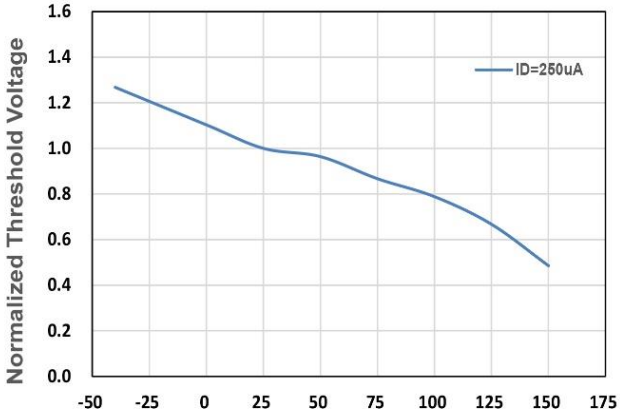

Figure 4. Gate Threshold Voltage

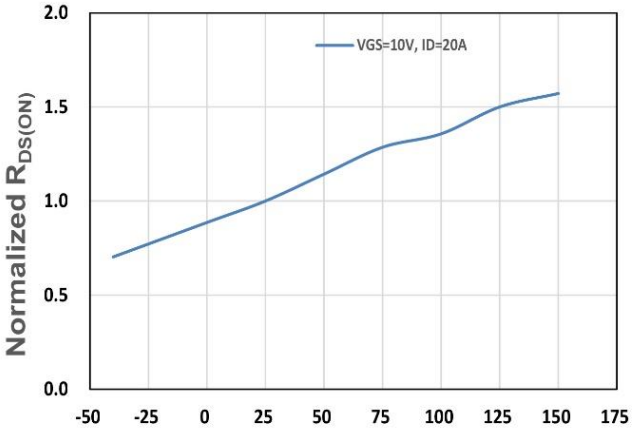

Figure 5. Drain-Source On Resistance

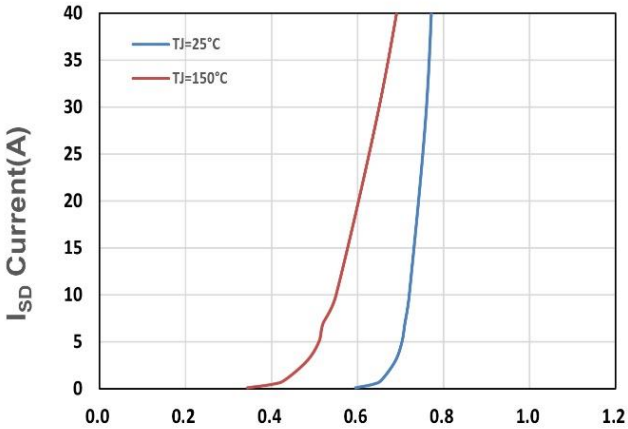

Figure 6. Source-Drain Diode Forward

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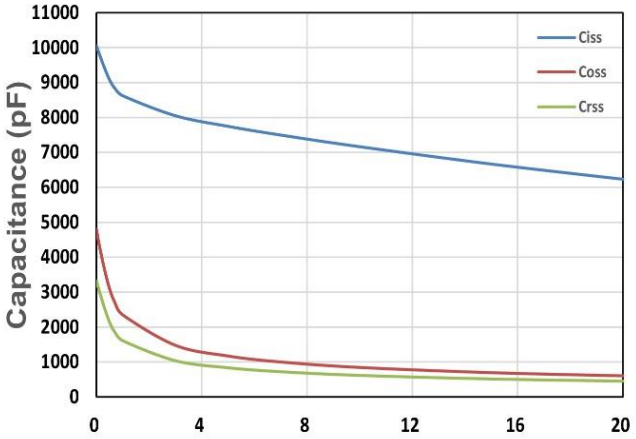


Figure 7. Capacitance

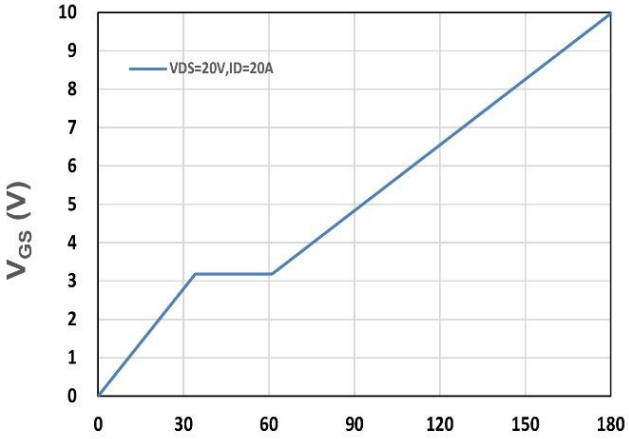


Figure 8. Gate Charge Characteristics

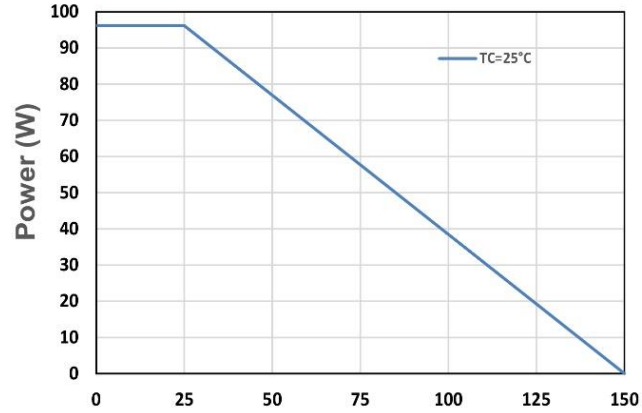


Figure 9. Power Dissipation

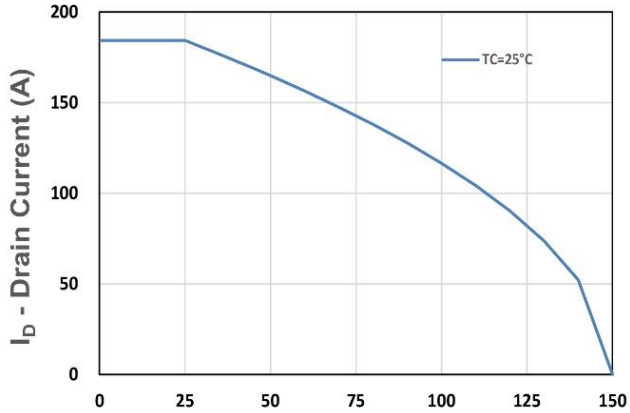


Figure 10. Drain Current

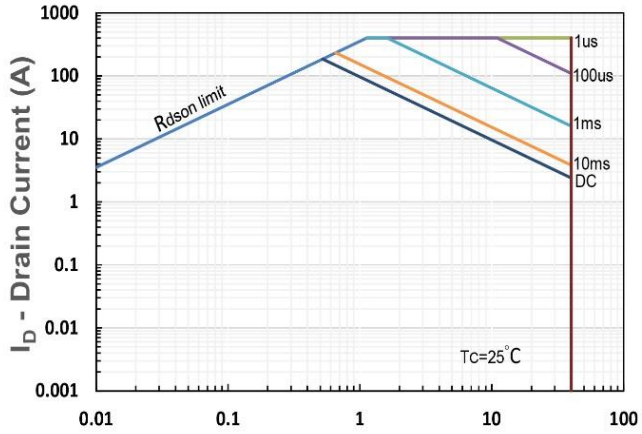


Figure 11. Safe Operating Area

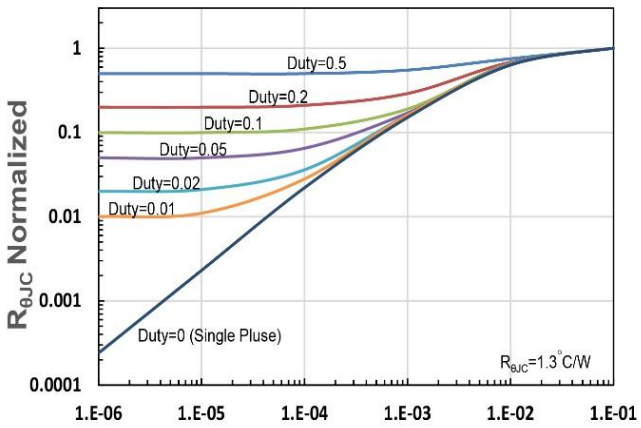
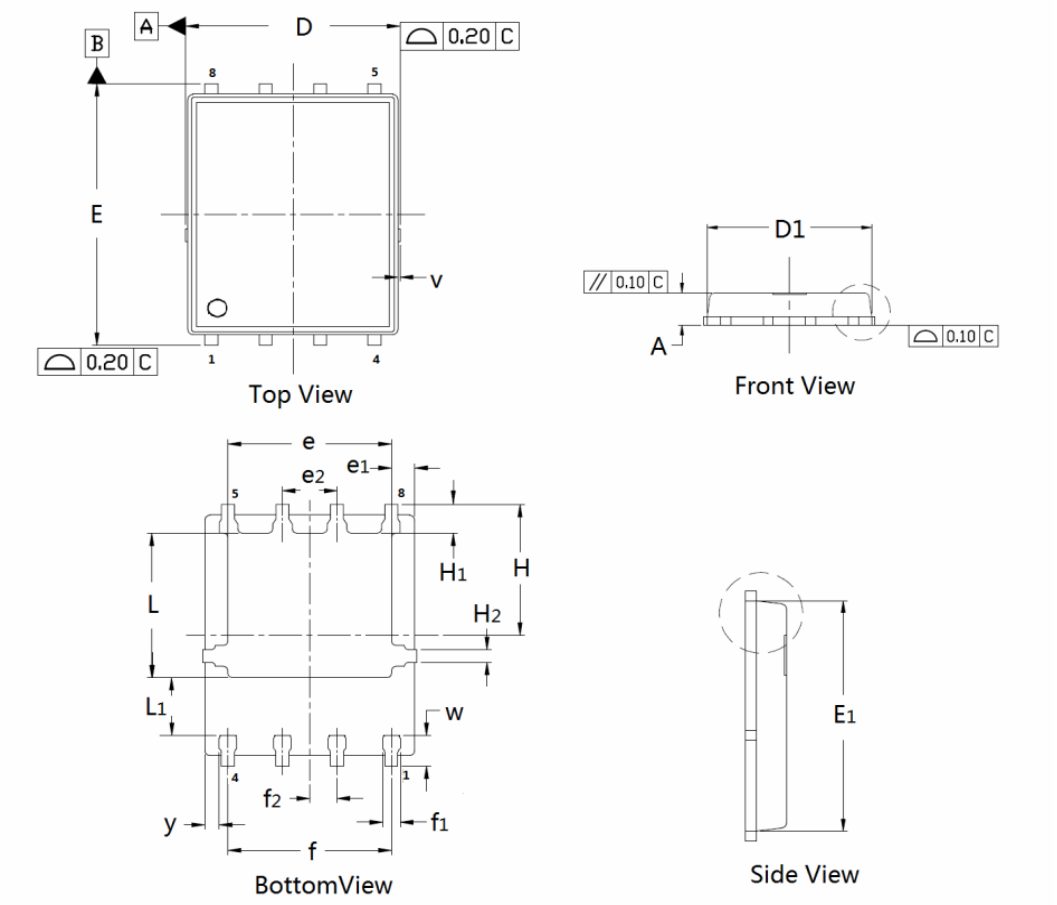


Figure 12. RθJC Transient Thermal Impedance

DFN5×6 Package Outline Data



DIMENSIONS (unit : mm)

Symbol		Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.02	1.10	**D**	4.90	4.98	5.10
D_1	4.80	4.89	5.10	**E**	5.90	6.11	6.25
E_1	5.65	5.74	5.95	**e**	3.72	3.80	3.92
e_1	--	0.5	--	**e_2**	--	1.	--
f	--	3.8	--	**f_1**	0.31	0.37	0.51
f_2	--	0.6	--	**H**	--	3.	--
H_1	0.59	0.63	0.79	**H_2**	0.26	0.28	0.32
L	3.35	3.45	3.65	**L_1**	--	1.	--
v	--	0.1	--	**w**	0.64	0.68	0.84
y	--	0.3	--		--		--