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}	30	V
$R_{DS(ON)-Typ}$	1.3	mΩ
I_D	100	A

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

Symbol	Parameter		N-Channel	Unit
V_{DSS}	Drain-Source Voltage		30	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		350	A
I_D	Continuous Drain Current	T_C=25°C	100	A
		T_A=25°C	31	
P_D	Maximum Power Dissipation	T_C=25°C	62.5	W
		T_A=25°C	2.5	
E_{AS} [②]	Avalanche Energy, Single pulse		151	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{θJA}$ [③]	Thermal Resistance-Junction to Ambient	50	℃/W
$R_{θJC}$	Thermal Resistance-Junction to Case	2.0	℃/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.

N-Channel Enhancement Mode MOSFET

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	30	---	---	V
I$_{DSS}$	Zero Gate Voltage Drain Current	V$_{DS}$=24V, V$_{GS}$=0V	---	---	1	uA
V$_{GS(th)}$	Gate Threshold Voltage	V$_{DS}$=V$_{GS}$, I$_D$=250uA	1.2	---	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	---	1.3	1.6	mΩ
		V$_{GS}$=4.5V, I$_D$=20A	---	1.9	2.5	
gfs	Forward Transconductance	V$_{DS}$=5V, I$_D$=20A	---	35	---	S
Dynamic Characteristics[5]						
C$_{iss}$	Input Capacitance	V$_{GS}$=0V, V$_{DS}$=15V, Freq.=1MHz	---	3420	---	pF
C$_{oss}$	Output Capacitance		---	1916	---	
C$_{rss}$	Reverse Transfer Capacitance		---	196	---	
T$_{d(on)}$	Turn-on Delay Time	V$_{DD}$=15V, V$_{GS}$=10V, R$_G$=3.3Ω, I$_D$=20A	---	10.3	---	nS
T$_r$	Turn-on Rise Time		---	6.2	---	
T$_{d(off)}$	Turn-off Delay Time		---	56	---	
T$_f$	Turn-off Fall Time		---	8.4	---	
Q$_g$	Total Gate Charge	V$_{DS}$=15V, V$_{GS}$=10V, I$_D$=20A	---	45	---	nC
Q$_{gs}$	Gate-Source Charge		---	9.8	---	
Q$_{gd}$	Gate-Drain Charge		---	6.5	---	
Source-Drain Characteristics						
V$_{SD}$[4]	Diode Forward Voltage	V$_{GS}$=0V, I$_S$=1A, T$_J$=25℃	---	---	1.2	V

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

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

N-Channel Enhancement Mode MOSFET

Typical Characteristics
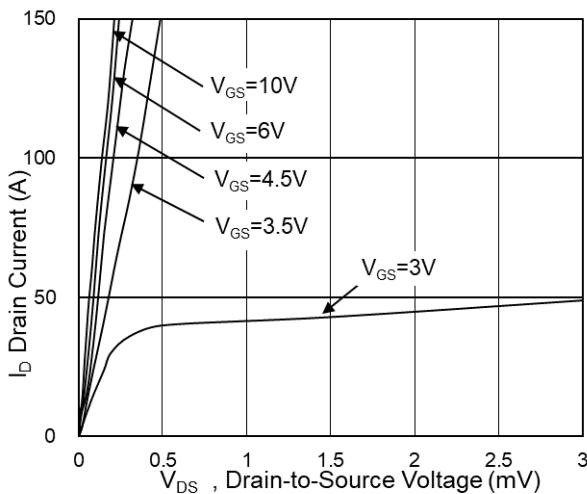
Fig.1 Typical Output Characteristics
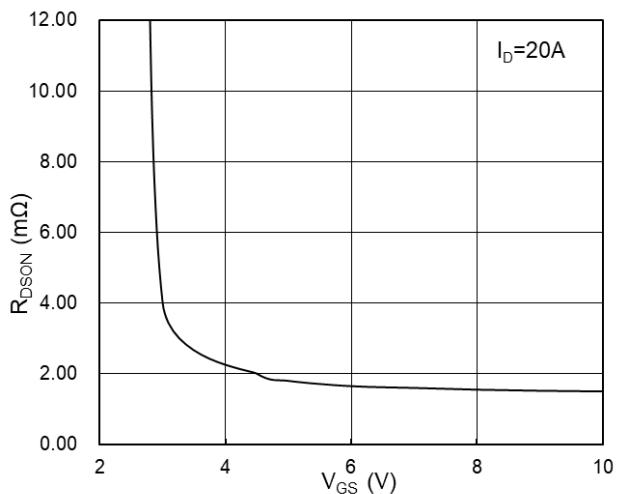
Fig.2 On-Resistance vs G-S Voltage
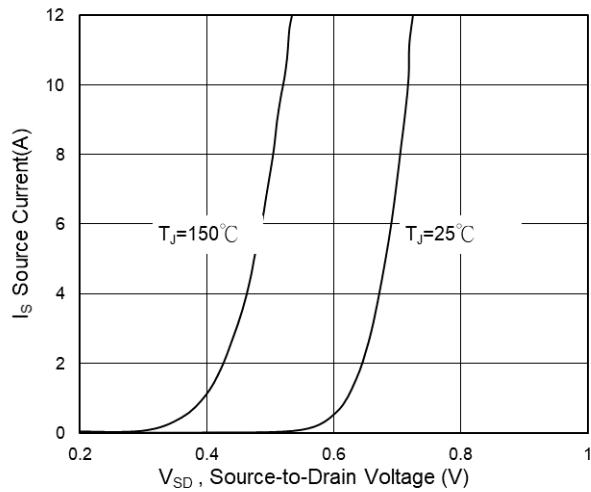
Fig.3 Source Drain Forward Characteristics
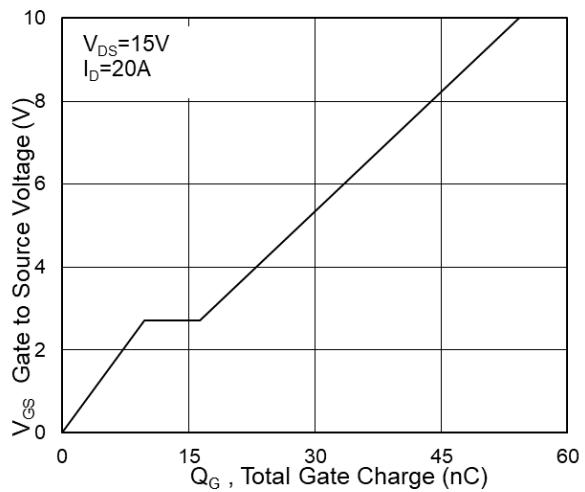
Fig.4 Gate-Charge Characteristics
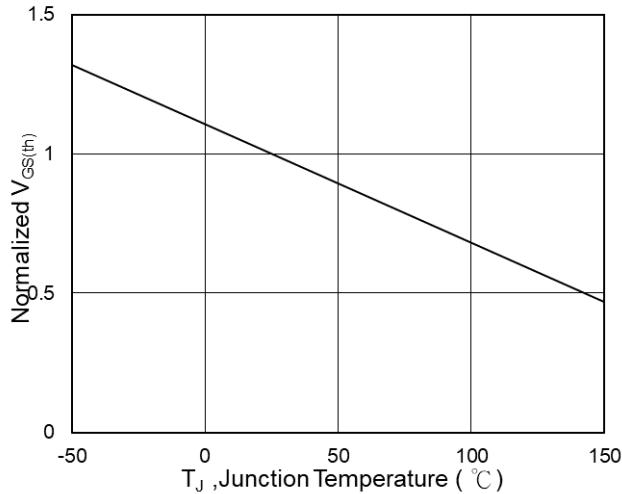
Fig.5 Normalized $V_{GS(th)}$ vs T_J
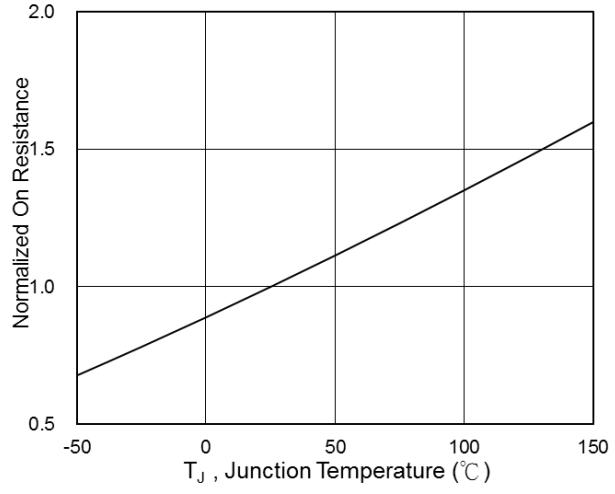
Fig.6 Normalized R_{DSON} vs T_J

N-Channel Enhancement Mode MOSFET
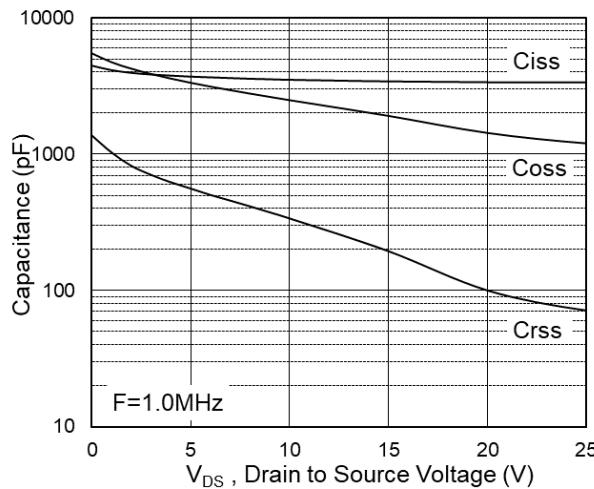
Fig.7 Capacitance
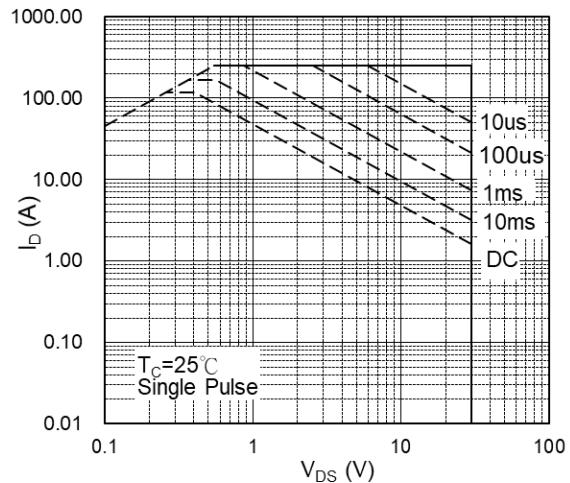
Fig.8 Safe Operating Area
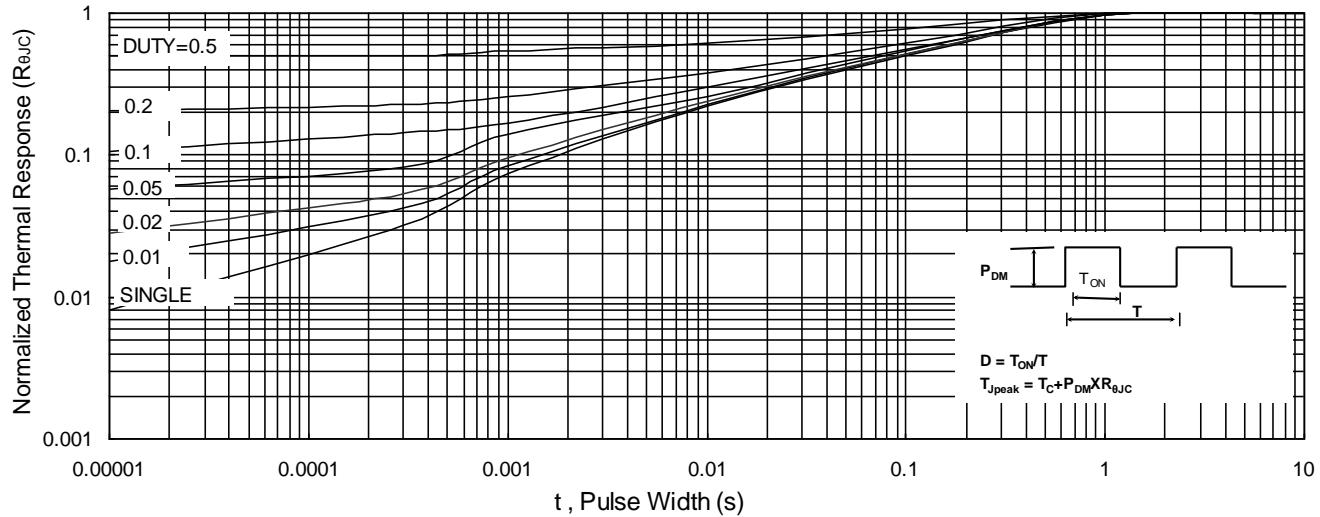
Fig.9 Normalized Maximum Transient Thermal Impedance

$$D = T_{ON}/T$$
$$T_{Jpeak} = T_C + P_{DM} \times R_{\theta JC}$$
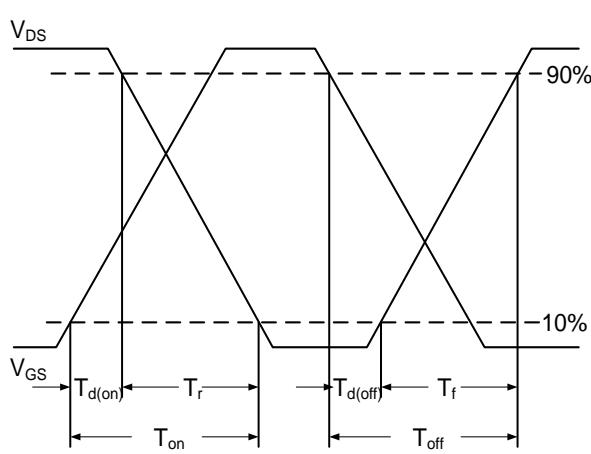
Fig.10 Switching Time Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$
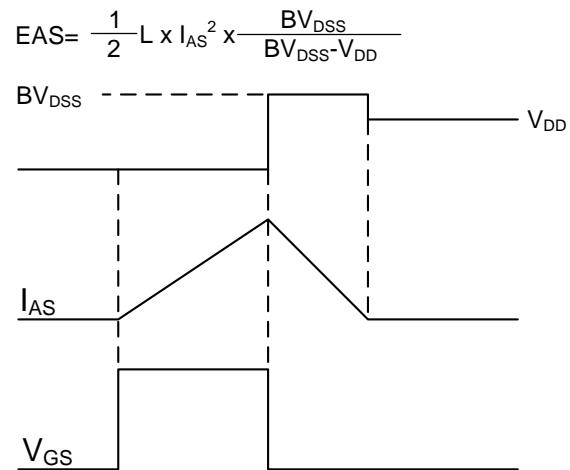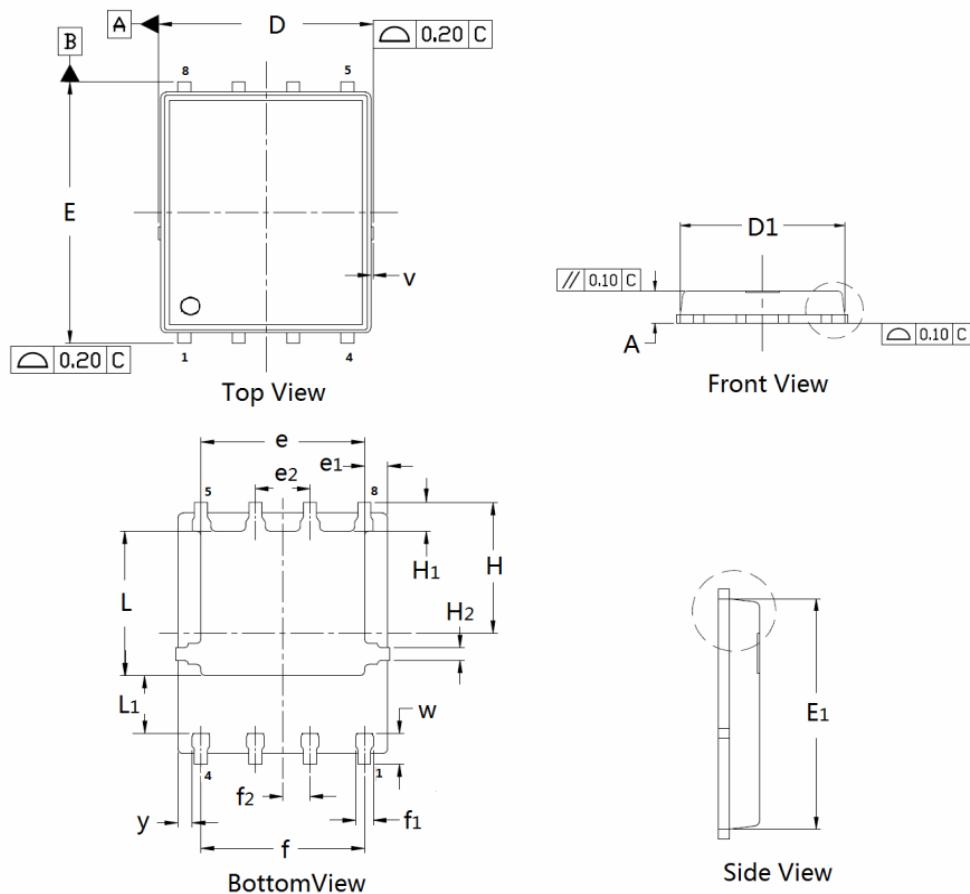
Fig.11 Unclamped Inductive Switching Waveform

N-Channel Enhancement Mode MOSFET

DFN5×6 Package Outline Data

Top View

Front View

Bottom View

Side View

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	--		--		--