

N-Channel Enhancement Mode MOSFET

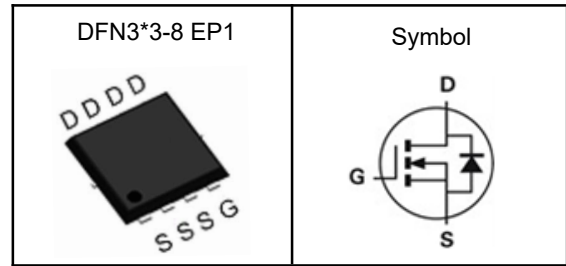
Features

- 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}	65	V
$R_{DS(ON)-Typ}$	3.7	$m\Omega$
I_D	75	A

Absolute Maximum Ratings ($T_C=25^\circ C$, Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	65	V
V_{GSS}	Gate-Source Voltage	± 20	V
T_J	Maximum Junction Temperature	-55 to 150	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
EAS	Single Pulse Avalanche Energy ³	140	mJ
$I_{DM}^{①}$	Pulse Drain Current Tested	300	A
I_D	Continuous Drain Current	75	A
P_D	Maximum Power Dissipation	61.2	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	2.04	$^\circ C/W$

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

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

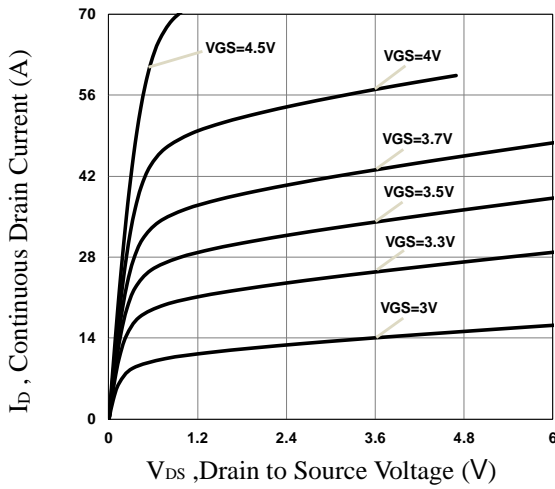
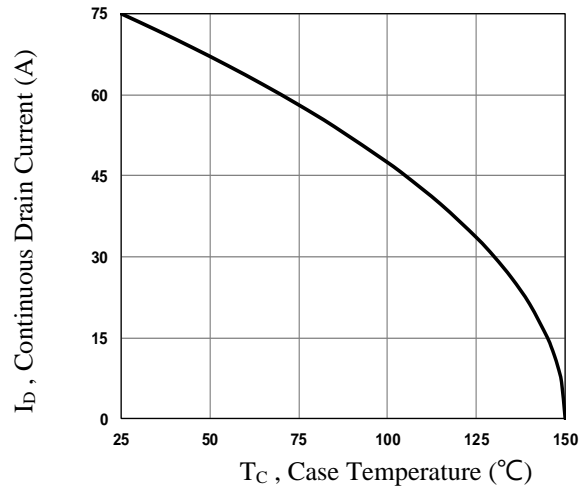
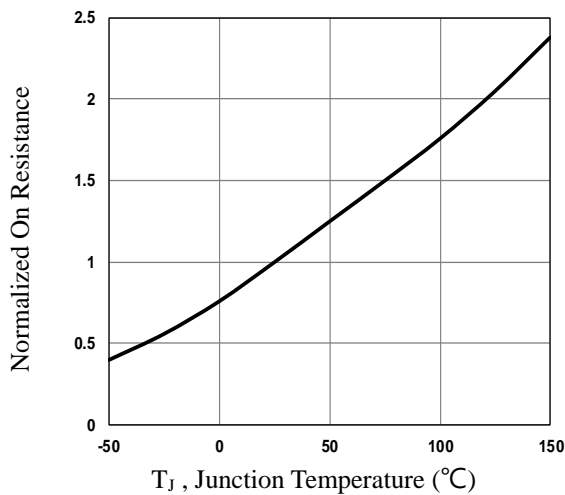
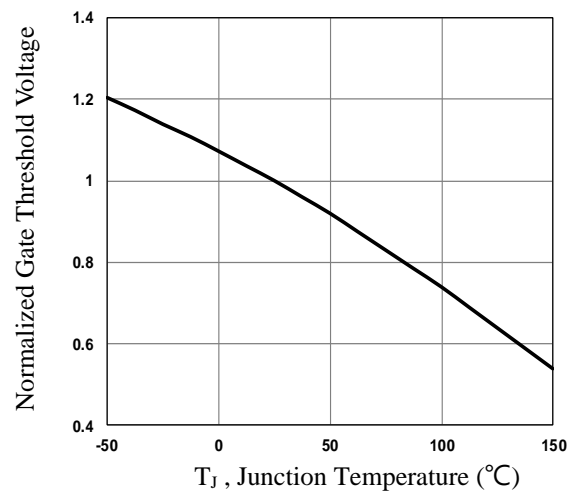
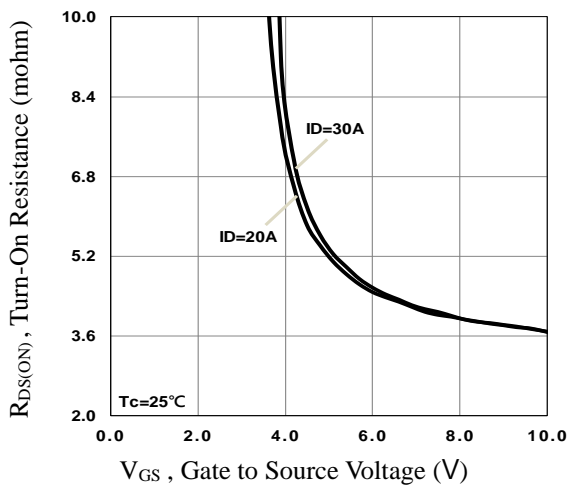
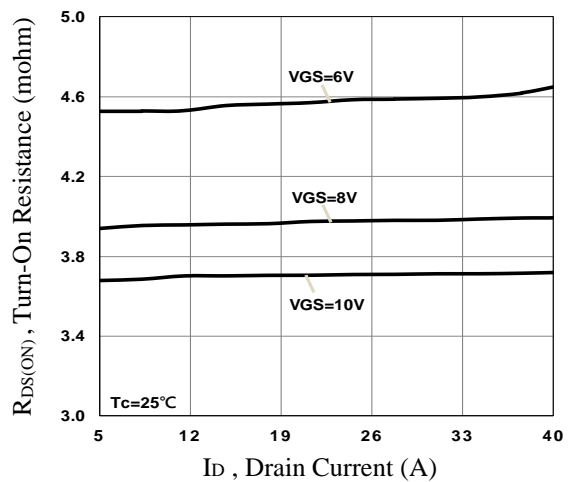
Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.

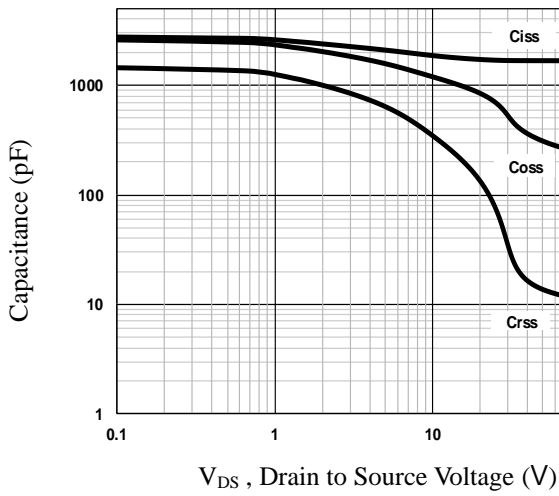
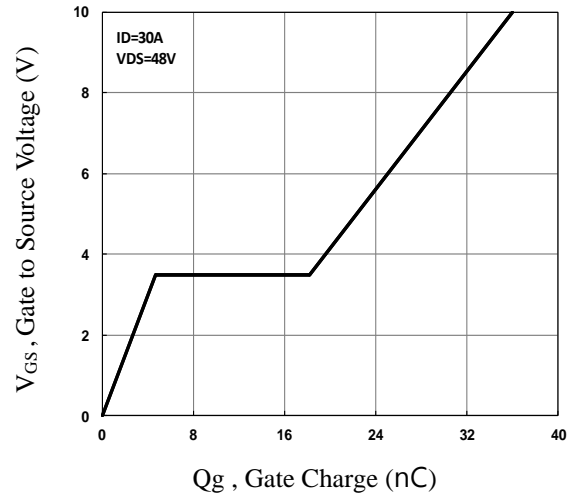
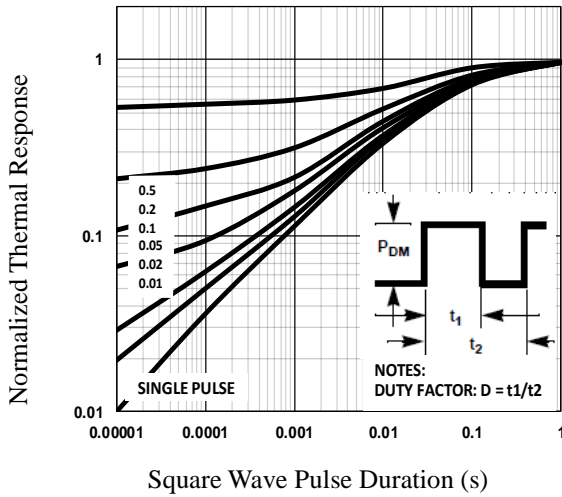
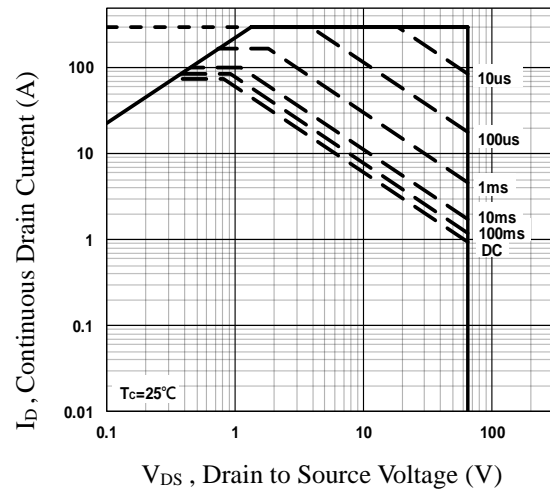
**N-Channel Enhancement Mode MOSFET****Electrical Characteristics** ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

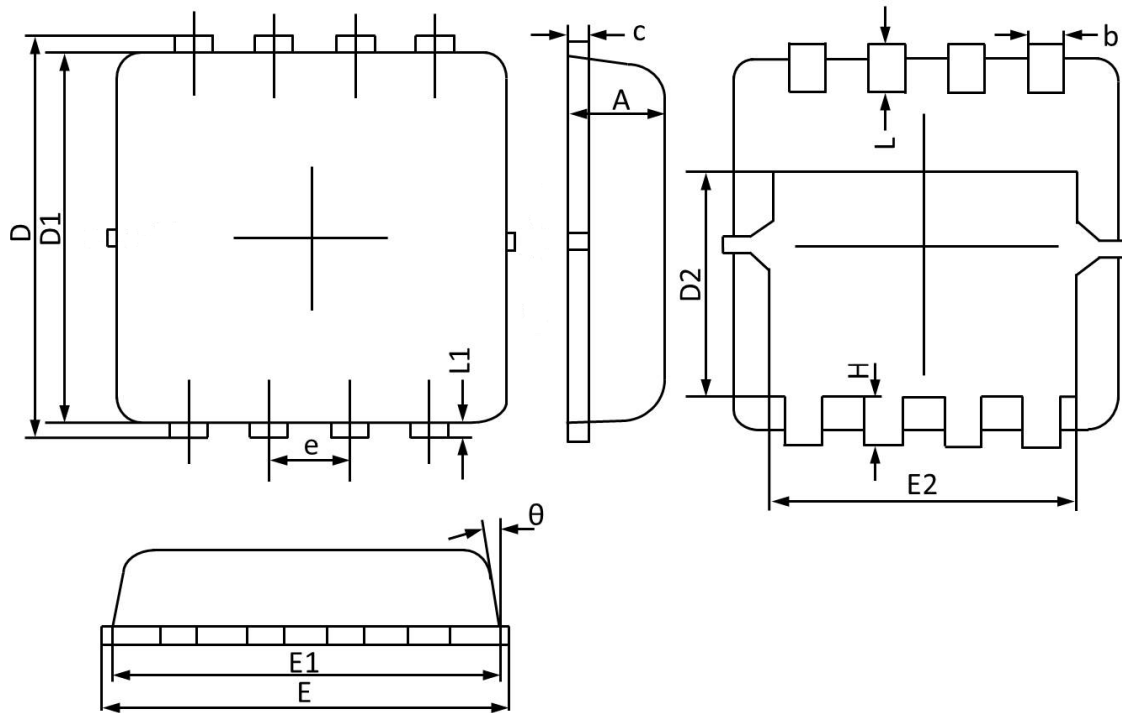
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	65	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$	---	---	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	---	2.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=20A$	---	3.7	4.5	m Ω
		$V_{GS}=4.5V, I_D=15A$	---	5.8	7.5	m Ω
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{DS}=48V, V_{GS}=0V, \text{Freq.}=1\text{MHz}$	---	1681	---	pF
C_{oss}	Output Capacitance		---	322	---	
C_{riss}	Reverse Transfer Capacitance		---	14	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DS}=48V, V_{GS}=10V, I_D=1A, R_G=6\Omega$	---	10.2	---	nS
T_r	Turn-on Rise Time		---	16	---	
$T_{d(off)}$	Turn-off Delay Time		---	42	---	
T_f	Turn-off Fall Time		---	38	---	
Q_g	Total Gate Charge	$V_{DS}=48V, V_{GS}=10V, I_D=30A$	---	36	---	nC
Q_{gs}	Gate-Source Charge		---	4.7	---	
Q_{gd}	Gate-Drain Charge		---	13.5	---	
Source-Drain Characteristics						
V_{SD}	Diode Forward Voltage	$I_S=1A, V_{GS}=0V$	---	---	1.0	V
t_{rr}	Reverse Recovery Time	$I_S=10A, V_{GS}=0V, di/dt=100A/\mu s$	---	54	---	nS
Q_{rr}	Reverse Recovery Charge		---	67	---	nC

Note ④: Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

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

N-Channel Enhancement Mode MOSFET
Typical Characteristics

Fig.1 Typical Output Characteristics

Fig.2 Continuous Drain Current vs. T_c

Fig.3 Normalized R_{DS(on)} vs. T_j

Fig.4 Normalized V_{th} vs. T_j

Fig.5 Turn-On Resistance vs. V_{GS}

Fig.6 Turn-On Resistance vs. I_D

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Fig.7 Capacitance Characteristics

Fig.8 Gate Charge Characteristics

Fig.9 Normalized Transient Impedance

Fig.10 Maximum Safe Operation Area

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DFN3*3-8 EP1 Package Outline Data


Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	0.70	0.75	0.85	E1	2.90	3.10	3.25
b	0.24	0.30	0.35	E2	2.35	2.50	2.60
c	0.10	0.17	0.25	e	0.65 BSC		
D	3.10	3.30	3.45	H	0.30	0.40	0.50
D1	2.90	3.05	3.20	L	0.30	0.40	0.50
D2	1.45	1.70	1.95	L1	--	0.13	--
E	3.05	3.25	3.40	theta	0°		14°