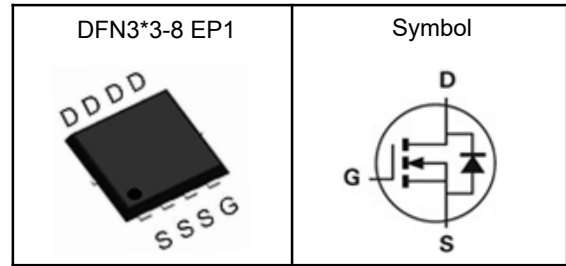


**N-Channel Enhancement Mode MOSFET**
**Features**

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

**Applications**

- Power Management in Desktop Computer
- DC/DC Converters

**Pin Description**


$V_{DSS}$	30	V
$R_{DS(ON)-Typ}$	7	m $\Omega$
$I_D$	46	A

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

Symbol	Parameter	N-Channel	Unit
$V_{DSS}$	Drain-Source Voltage	30	V
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	V
$T_J$	Maximum Junction Temperature	-55 to 150	$^{\circ}C$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^{\circ}C$
$I_{DM}^{①}$	Pulse Drain Current Tested	92	A
$I_D$	Continuous Drain Current	46	A
$P_D$	Maximum Power Dissipation	29	W
$E_{AS}$	Avalanche Energy, Single pulse	57.8	mJ

**Thermal Characteristics**

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	75	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	4.32	$^{\circ}C/W$

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 1in<sup>2</sup> FR-4 board with 1oz.



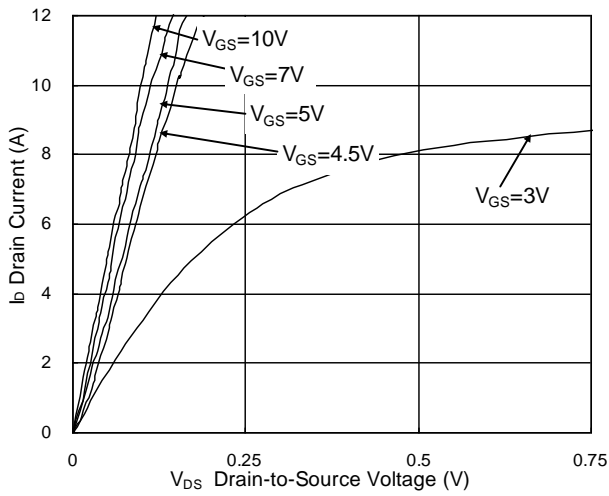
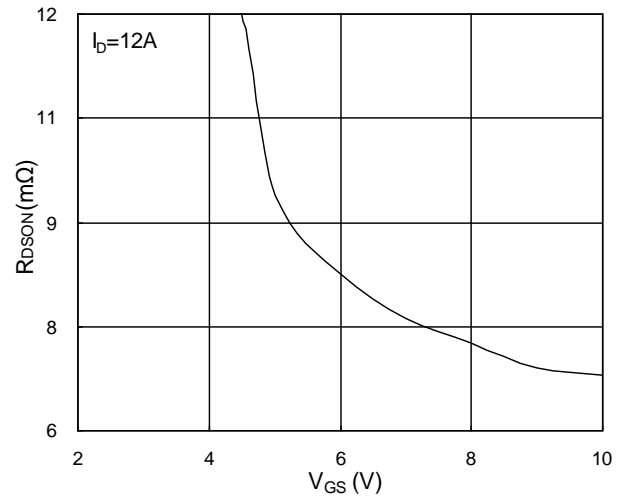
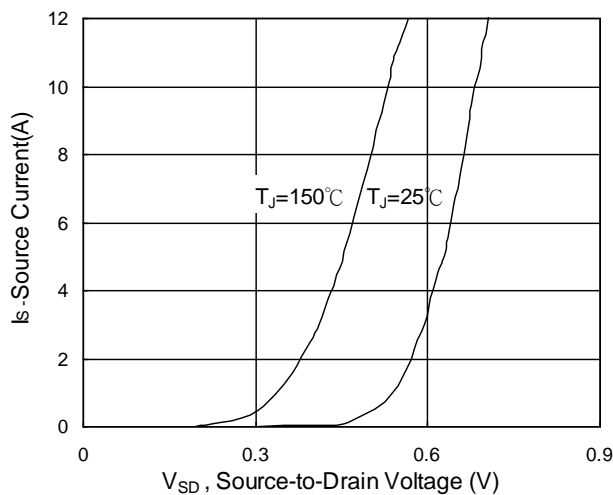
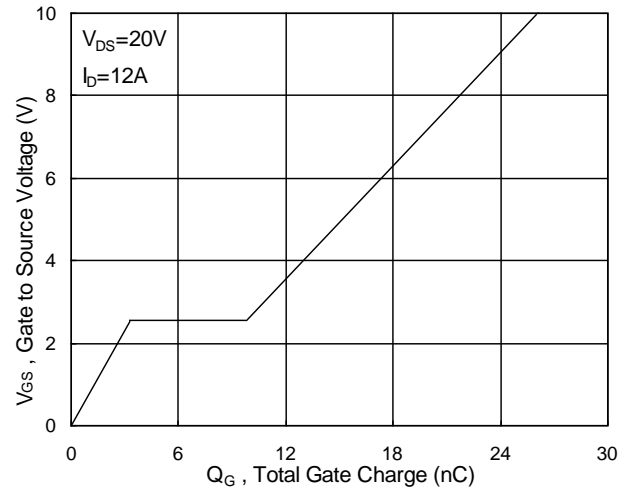
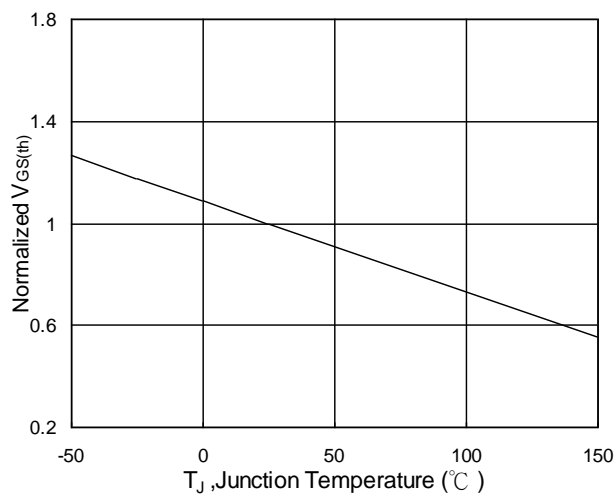
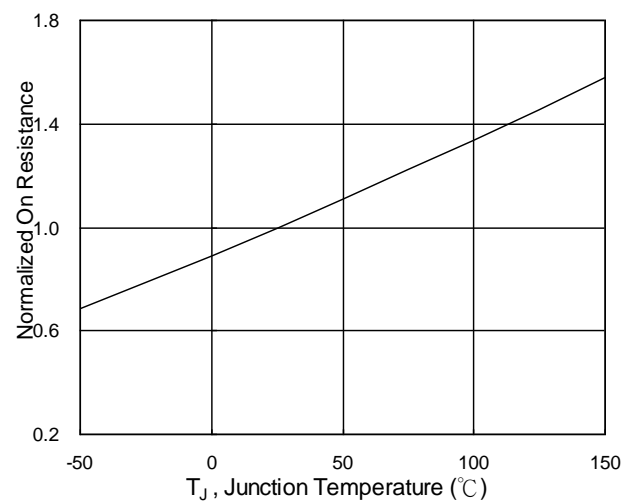
**N-Channel Enhancement Mode MOSFET**

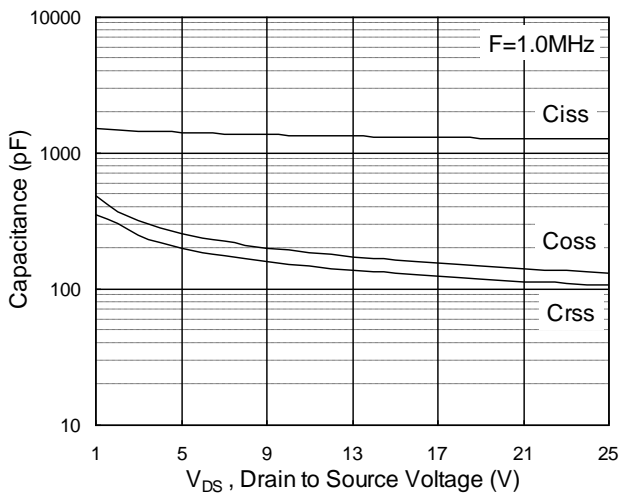
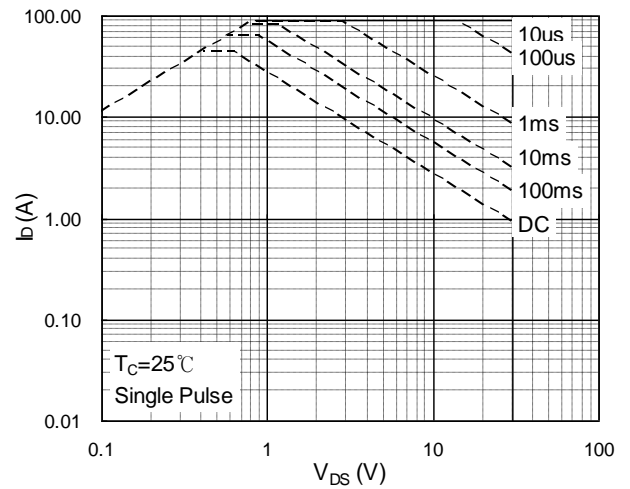
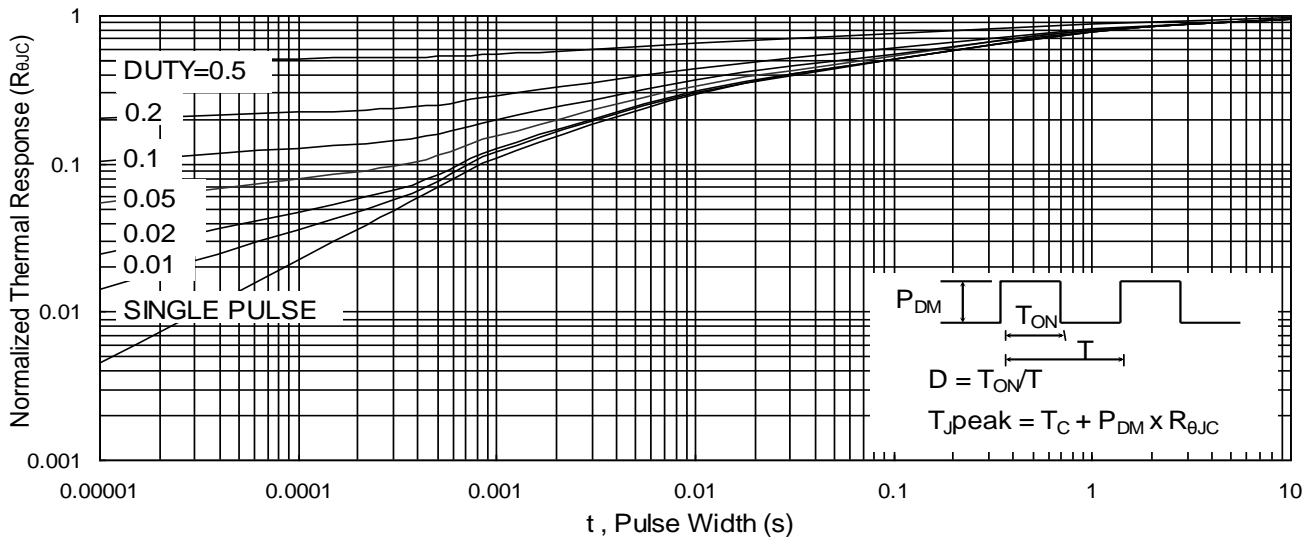
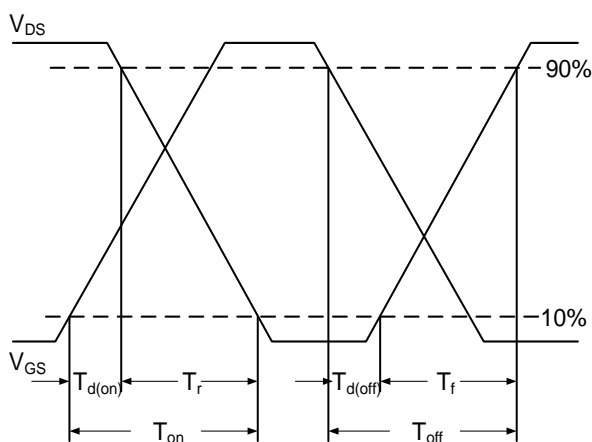
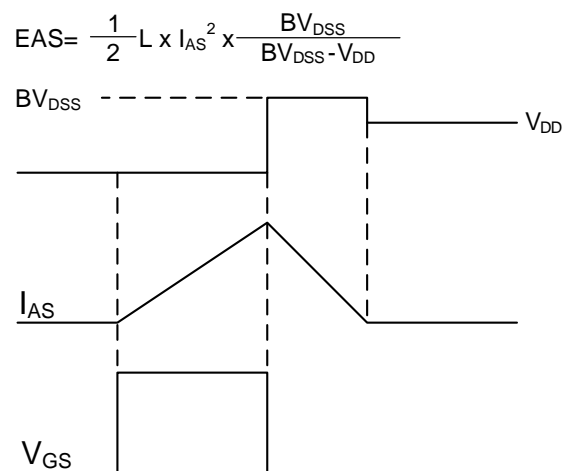
**Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$ , Unless Otherwise Noted)

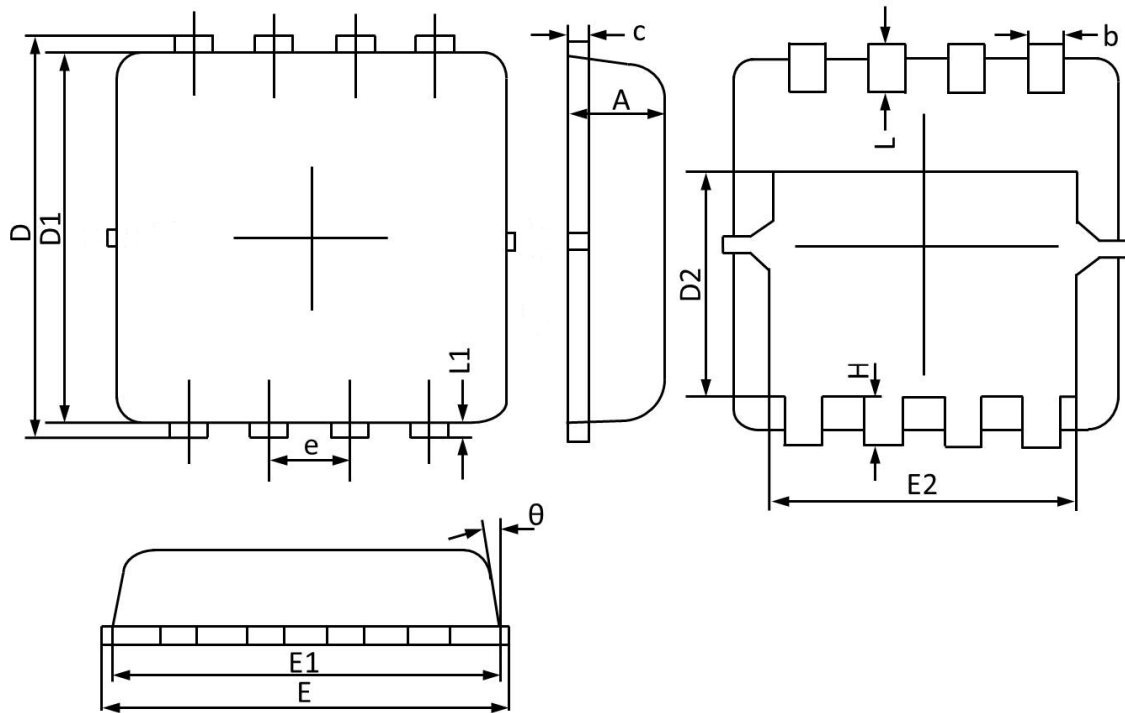
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
<b>Static Electrical Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=24V, V_{GS}=0V$	---	---	1	$\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1	---	2.5	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=12A$	---	7	8.5	m $\Omega$
		$V_{GS}=4.5V, I_D=10A$	---	10	13	m $\Omega$
<b>Dynamic Characteristics</b> <sup>⑤</sup>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=15V, \text{Freq.}=1\text{MHz}$	---	1317	---	pF
$C_{oss}$	Output Capacitance		---	163	---	
$C_{riss}$	Reverse Transfer Capacitance		---	131	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=12V, V_{GS}=10V, R_G=3.3\Omega, I_D=5A$	---	4.5	---	nS
$T_r$	Turn-on Rise Time		---	10.8	---	
$T_{d(off)}$	Turn-off Delay Time		---	25.5	---	
$T_f$	Turn-off Fall Time		---	9.6	---	
$Q_g$	Total Gate Charge	$V_{GS}=10V, V_{DS}=4.5V, I_D=12A$	---	12.8	---	nC
$Q_{gs}$	Gate-Source Charge		---	3.3	---	
$Q_{gd}$	Gate-Drain Charge		---	6.5	---	
<b>Source-Drain Characteristics</b>						
$V_{SD}$	Diode Forward Voltage	$I_S=1A, V_{GS}=0V$	---	---	1.0	V
$I_S$	Continuous Source Current <sup>1,5</sup>	$V_G=V_D=0V, \text{Force Current}$	---	---	46	A
$I_{SM}$	Pulsed Source Current <sup>2,5</sup>		---	---	92	A

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 On-Resistance vs. G-S Voltage**

**Fig.3 Forward Characteristics of Reverse**

**Fig.4 Gate-Charge Characteristics**

**Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$** 

**Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$**

**N-Channel Enhancement Mode MOSFET**

**Fig.7 Capacitance**

**Fig.8 Safe Operating Area**

**Fig.9 Normalized Maximum Transient Thermal Impedance**

**Fig.10 Switching Time Waveform**

**Fig.11 Unclamped Inductive Switching Waveform**

**N-Channel Enhancement Mode MOSFET**
**DFN3\*3-8 EP1 Package Outline Data**


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