

## N-Channel Enhancement Mode MOSFET

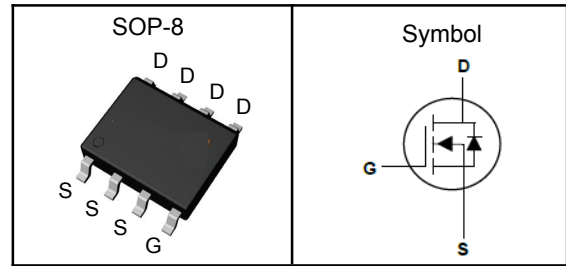
### Features

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

### Applications

- Power Management in Desktop Computer
- DC/DC Converters

### Pin Description



$V_{DSS}$	30	V
$R_{DS(ON)-Typ}$	4.4	m $\Omega$
$I_D$	20	A

### Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ , 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	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$E_{AS}$	Single Pulse Avalanche Energy <sup>③</sup> (L=0.1mH)	42	mJ
$I_{DM}^{①}$	Pulse Drain Current Tested	37	A
$I_D$	Continuous Drain Current	$T_A=25^\circ\text{C}$	A
$P_D$	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	W

### Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>①</sup> (Steady State)	78	$^\circ\text{C}/\text{W}$
$R_{\theta JL}$	Thermal Resistance-Junction to Lead (Steady State)	20	$^\circ\text{C}/\text{W}$

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



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**Electrical Characteristics** (T<sub>J</sub>=25°C, Unless Otherwise Noted)

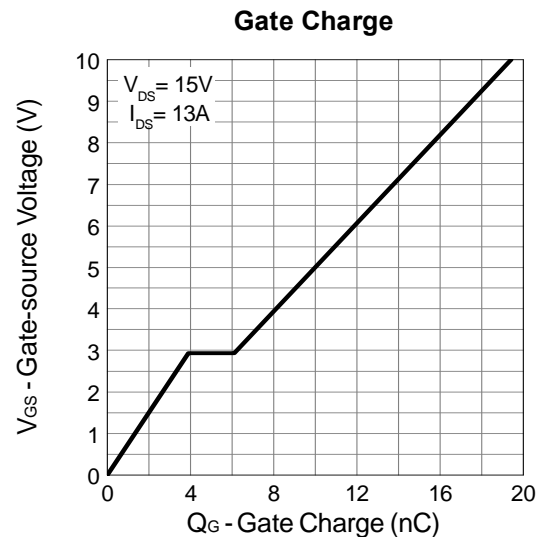
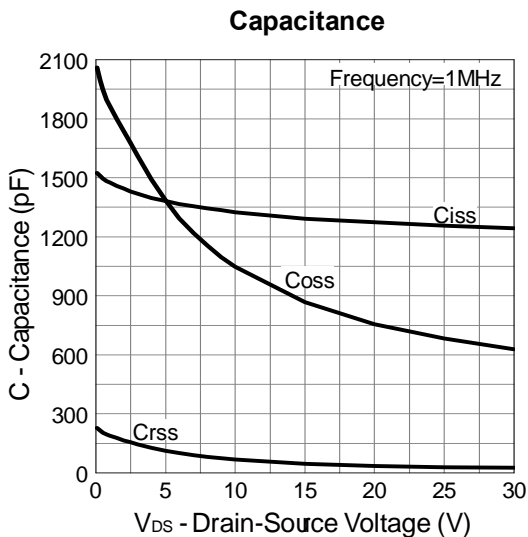
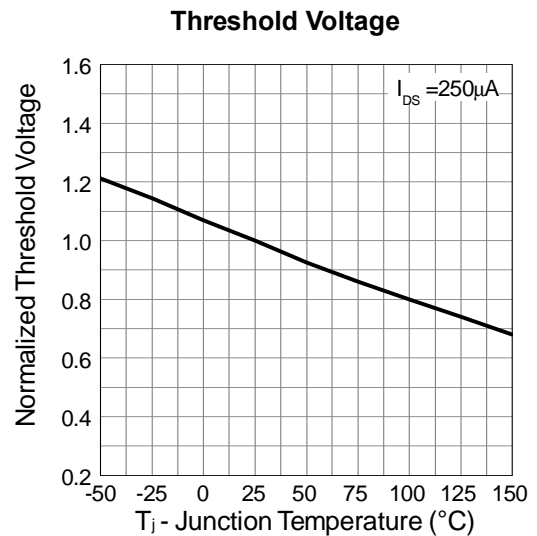
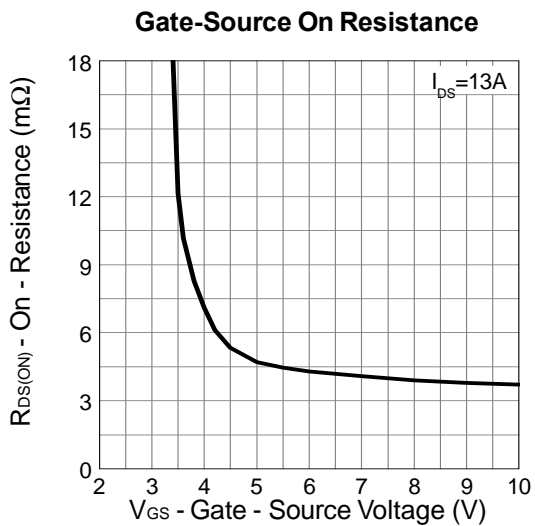
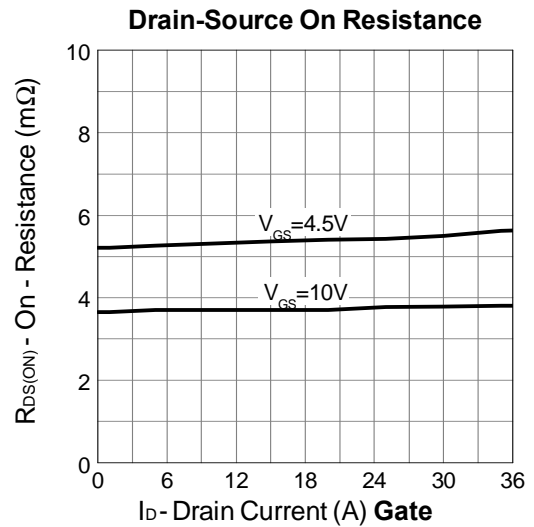
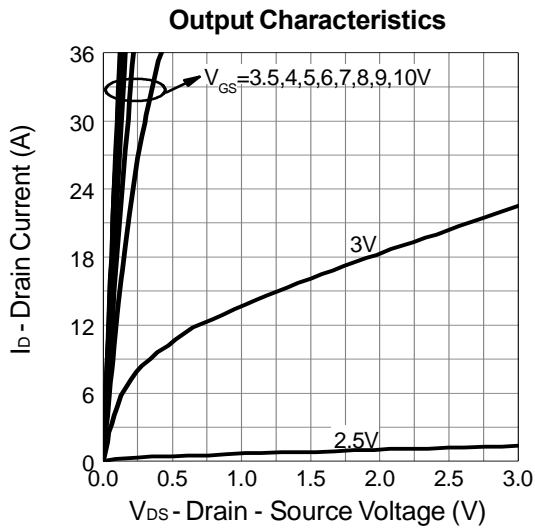
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
<b>Static Electrical Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30	---	---	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =24V, V <sub>GS</sub> =0V	---	---	1	uA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.4	---	2.5	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
R <sub>DS(on)</sub>	Drain-Source On-state Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =13A	---	3.2	4.4	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =9A	---	5.0	6.8	
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =7.6V, I <sub>DS</sub> =8A	---	22	---	S
<b>Dynamic Characteristics</b> <sup>⑤</sup>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, Freq.=1MHz	---	1600	---	pF
C <sub>oss</sub>	Output Capacitance		---	900	---	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	65	---	
T <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> =15V, V <sub>GEN</sub> =10V, R <sub>G</sub> =1Ω, I <sub>D</sub> =1A, R <sub>L</sub> =15Ω,	---	13.6	---	nS
T <sub>r</sub>	Turn-on Rise Time		---	12.6	---	
T <sub>d(off)</sub>	Turn-off Delay Time		---	24.4	---	
T <sub>f</sub>	Turn-off Fall Time		---	38.4	---	
Q <sub>g</sub>	Total Gate Charge	V <sub>DD</sub> =15V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =13A	---	9.4	---	nC
Q <sub>gs</sub>	Gate-Source Charge		---	3.9	---	
Q <sub>gd</sub>	Gate-Drain Charge		---	2.2	---	
<b>Source-Drain Characteristics</b> (T <sub>J</sub> =25°C)						
V <sub>SD</sub>	Diode Forward Voltage <sub>z</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =10A, T <sub>J</sub> =25°C	---	0.78	1.1	V
t <sub>rr</sub>	Reverse Recovery Time	V <sub>DD</sub> =15V, I <sub>F</sub> =13A, di/dt=100A/μs, T <sub>J</sub> =25°C	---	52	---	nS
Q <sub>rr</sub>	Reverse Recovery Charge		---	30	---	nC

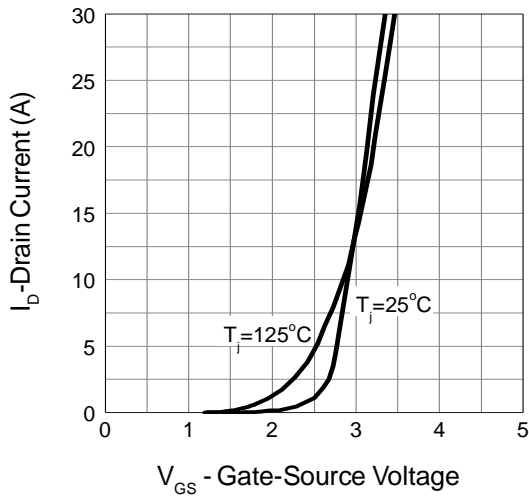
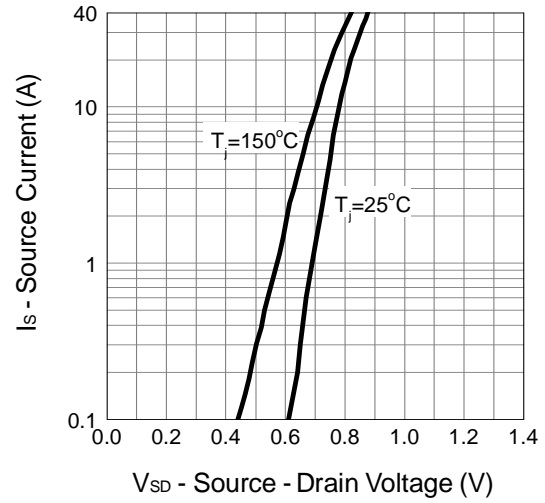
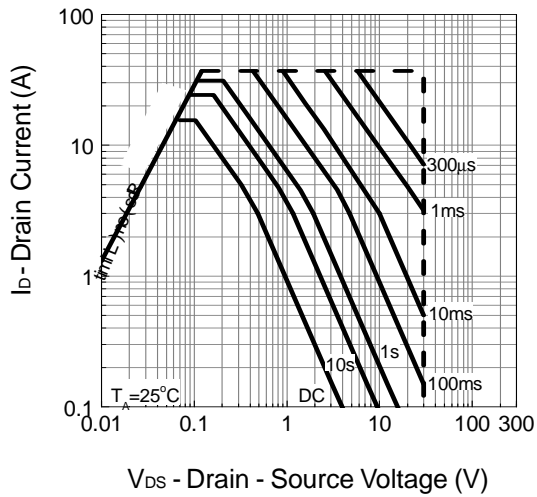
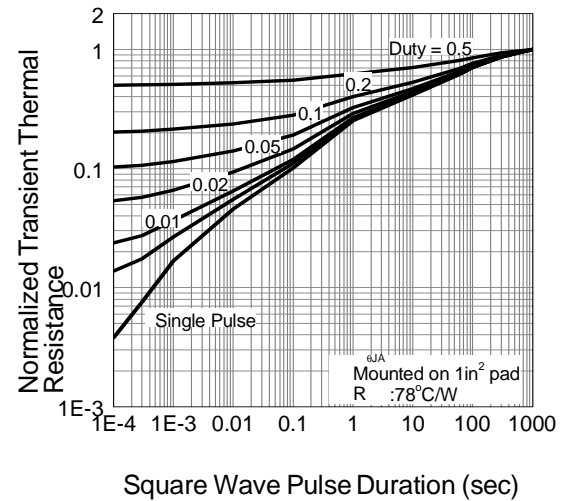
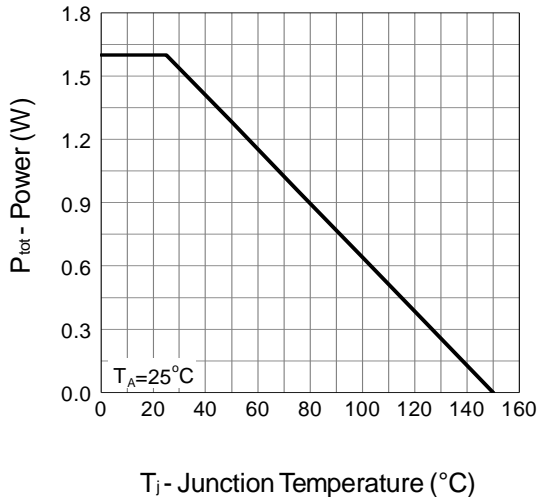
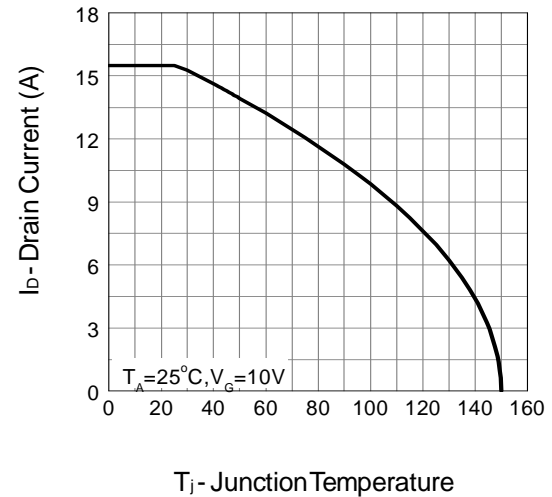
Note ④ : Pulse test (pulse width≤300us, duty cycle≤2%).

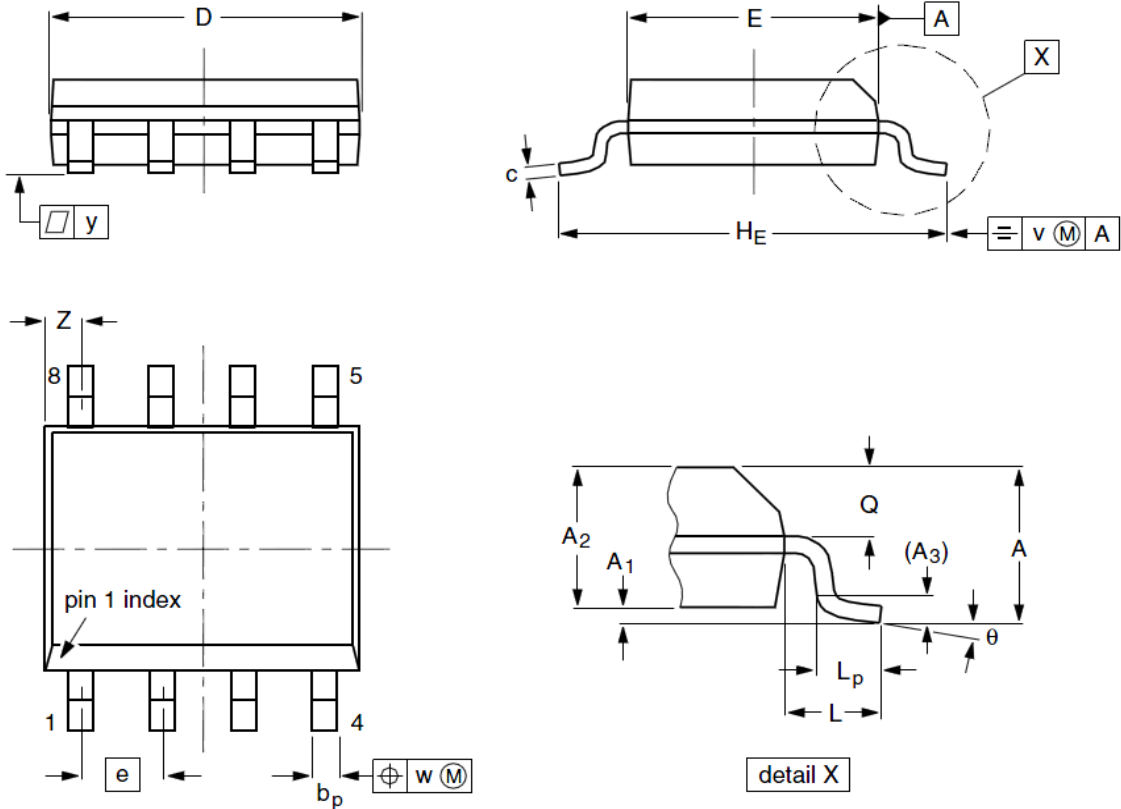
Note ⑤ : Guaranteed by design, not subject to production testing.

# N-Channel Enhancement Mode MOSFET

## Typical Characteristics



**N-Channel Enhancement Mode MOSFET**
**Transfer Characteristics**

**Source-Drain Diode Forward**

**Safe Operation Area**

**Thermal Transient Impedance**

**Power Dissipation**

**Drain Current**


**N-Channel Enhancement Mode MOSFET**
**SOP-8 Package Outline Data**


Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
<b>A</b>	1.35	1.55	1.75	<b>A<sub>1</sub></b>	0.10	0.18	0.25
<b>A<sub>2</sub></b>	1.25	1.45	1.65	<b>A<sub>3</sub></b>	--	0.25	--
<b>b<sub>p</sub></b>	0.36	0.42	0.51	<b>c</b>	0.19	0.22	0.25
<b>D</b>	4.70	4.92	5.10	<b>E</b>	3.80	3.90	4.00
<b>e</b>	--	1.27	--	<b>H<sub>E</sub></b>	5.80	6.00	6.20
<b>L</b>	--	1.05	--	<b>L<sub>p</sub></b>	0.40	0.68	1.00
<b>Q</b>	0.60	0.65	0.73	<b>v</b>	--	0.25	--
<b>w</b>	--	0.25	--	<b>y</b>	--	0.10	--
<b>Z</b>	0.30	0.50	0.70	<b>θ</b>	0°		8°