

N-Channel Enhancement Mode MOSFET

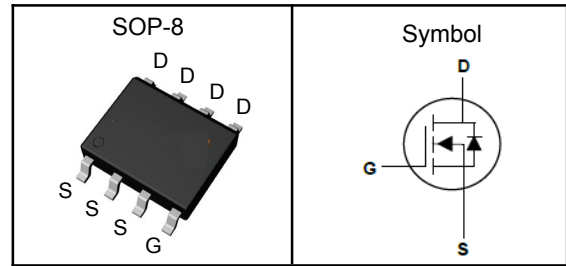
Features

- 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}	60	V
$R_{DS(ON)-Typ}$	11	m Ω
I_D	12	A

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

Symbol	Parameter	N-Channel	Unit
V_{DSS}	Drain-Source Voltage	60	V
V_{GSS}	Gate-Source Voltage	± 20	V
T_J	Maximum Junction Temperature	-55 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$I_{DM}^{①}$	Pulse Drain Current Tested	120	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 ₁ (Max)	42	$^\circ\text{C}/\text{W}$

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

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150°C .

Note ③ : Surface Mounted on 1in^2 FR-4 board with 1oz.



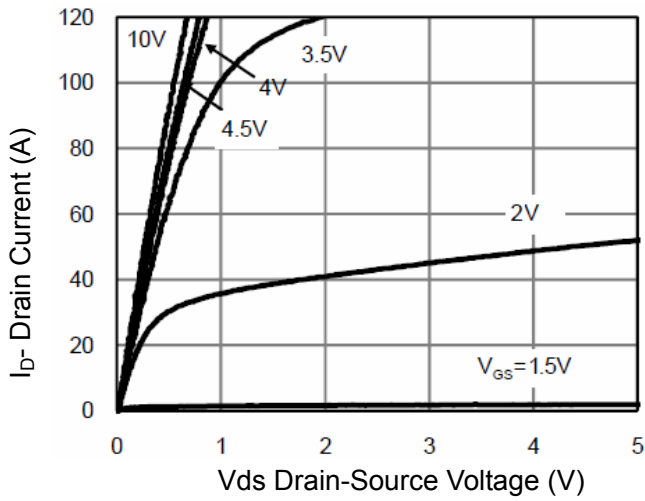
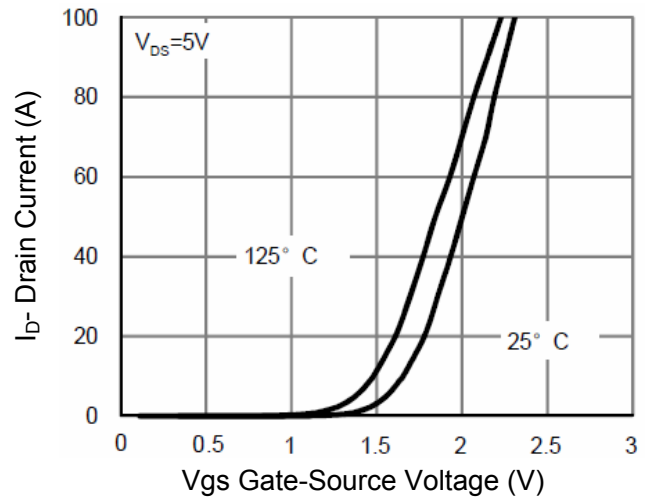
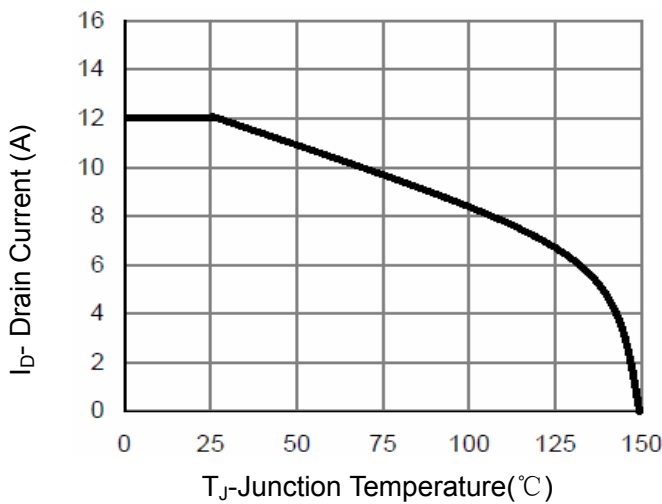
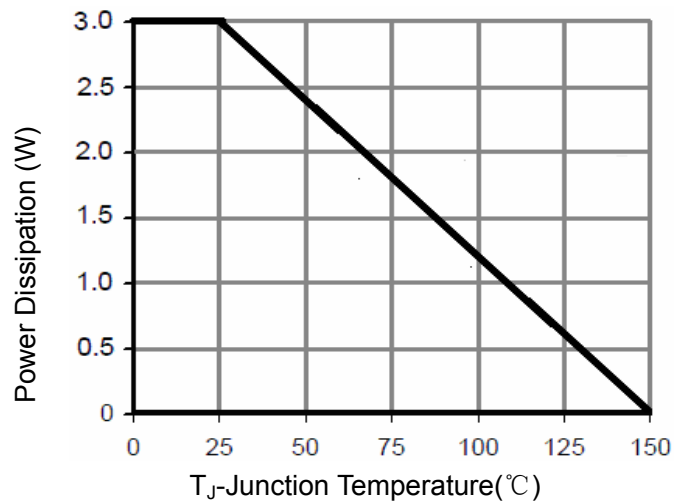
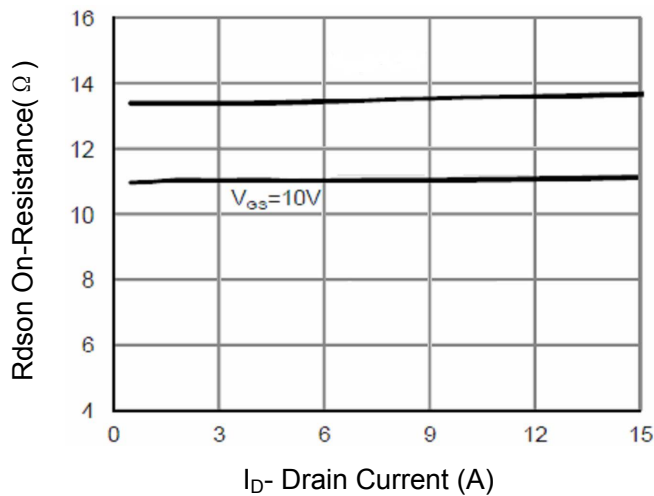
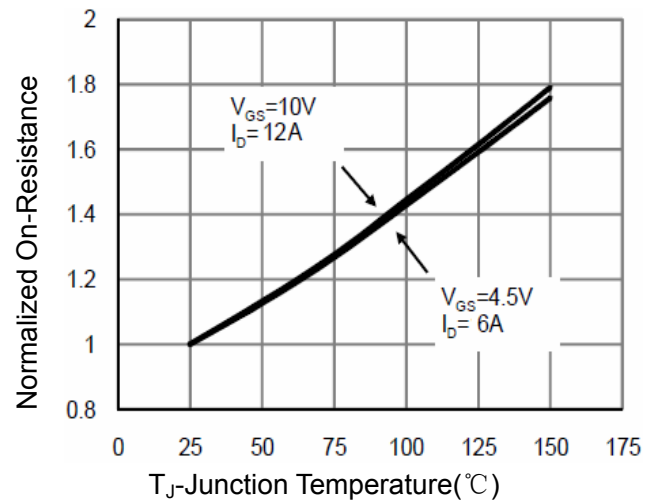
N-Channel Enhancement Mode MOSFET

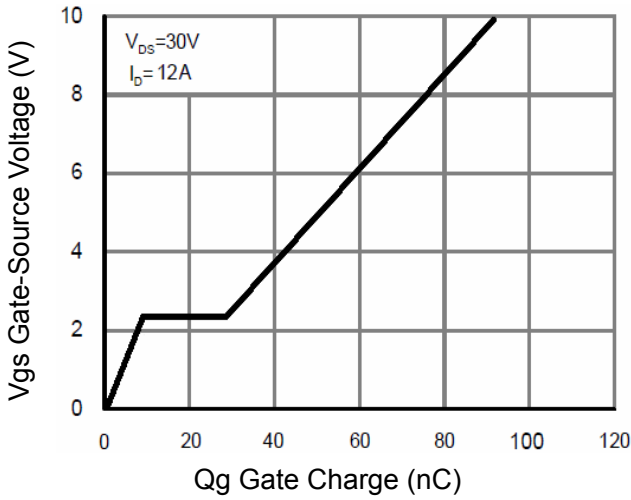
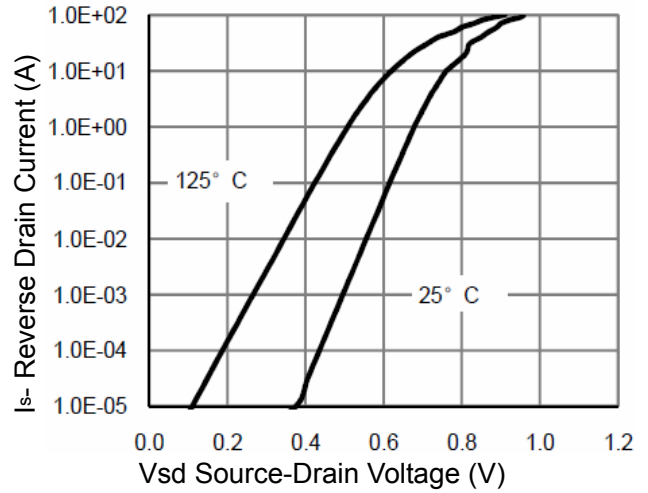
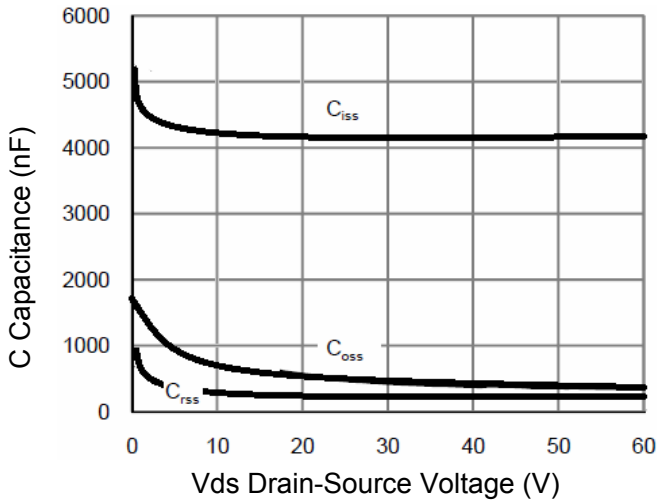
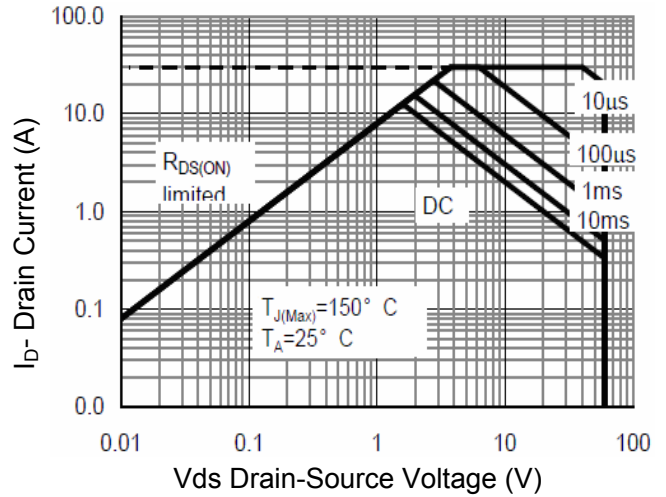
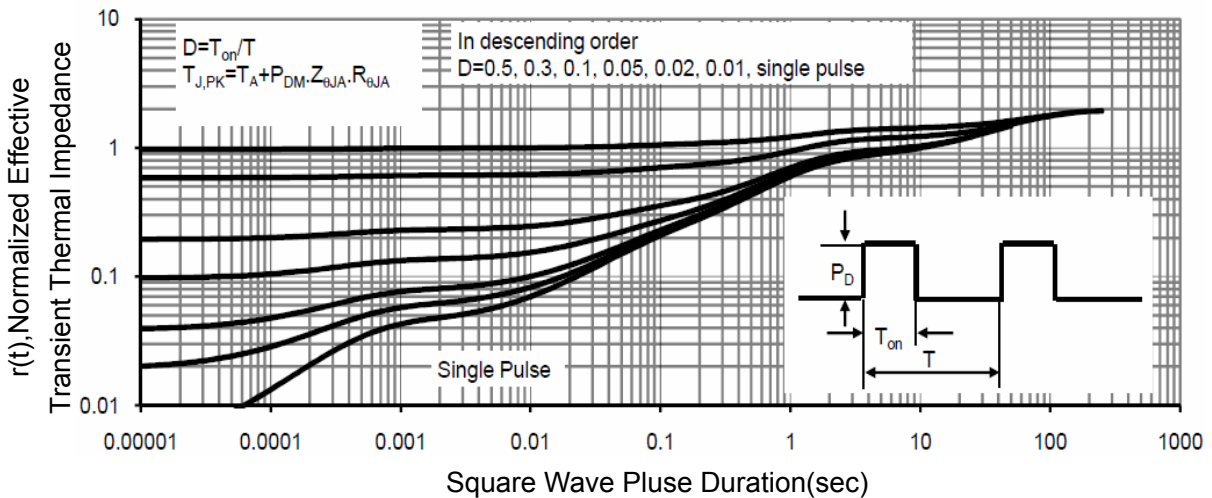
Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

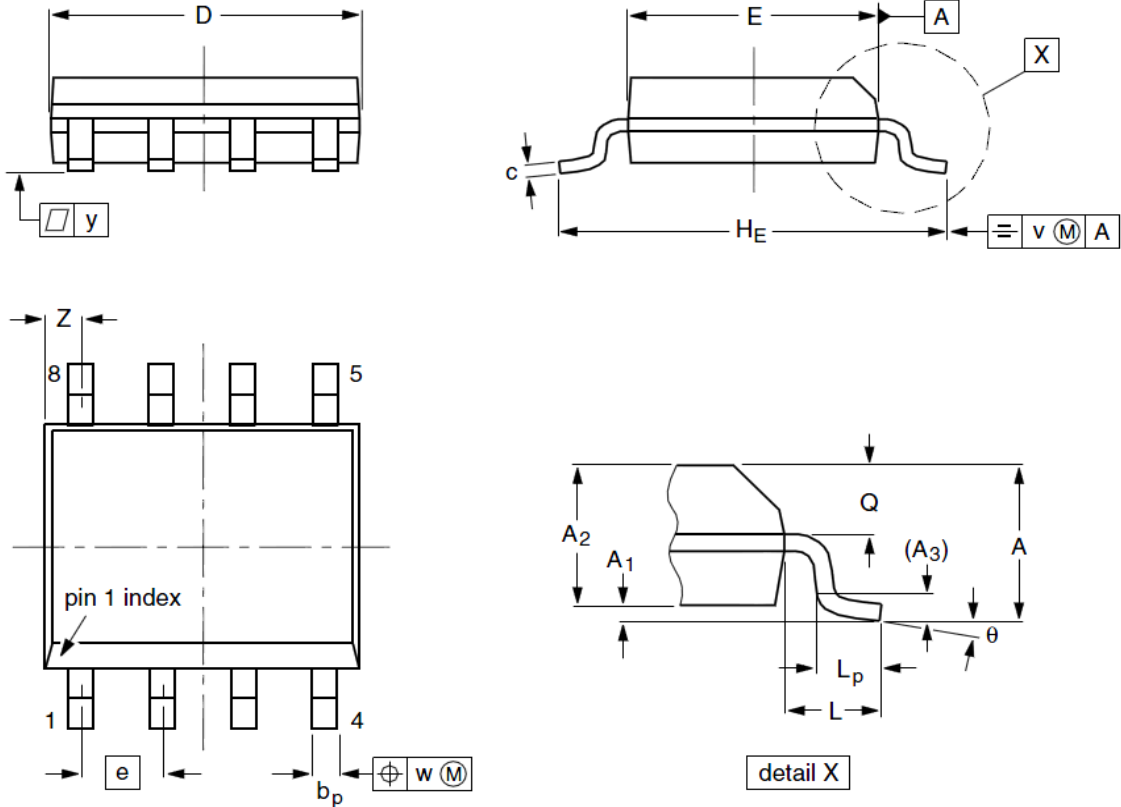
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$	---	---	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	---	3.0	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=12A$	---	11	13	m Ω
		$V_{GS}=4.5V, I_D=6A$	---	18.5	23	
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=30V,$ Freq.=1MHz	---	4065	---	pF
C_{oss}	Output Capacitance		---	285	---	
C_{rss}	Reverse Transfer Capacitance		---	220	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=30V, R_L=1\Omega,$ $V_{GS}=10V, R_G=3\Omega$	---	8.5	---	nS
T_r	Turn-on Rise Time		---	7	---	
$T_{d(off)}$	Turn-off Delay Time		---	40	---	
T_f	Turn-off Fall Time		---	15	---	
Q_g	Total Gate Charge	$V_{DD}=30V, V_{GS}=10V,$ $I_D=12A$	---	92	---	nC
Q_{gs}	Gate-Source Charge		---	9.5	---	
Q_{gd}	Gate-Drain Charge		---	19	---	
Source-Drain Characteristics ($T_J=25^{\circ}\text{C}$)						
V_{SD}	Diode Forward Voltage _z	$V_{GS}=0V, I_S=12A, T_J=25^{\circ}\text{C}$	---	---	1.2	V
t_{rr}	Reverse Recovery Time	$I_F=12A,$ $di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	33	---	nS
Q_{rr}	Reverse Recovery Charge		---	47	---	nC

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

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

N-Channel Enhancement Mode MOSFET
Typical Characteristics

Figure 1 Output Characteristics

Figure 2 Transfer Characteristics

Figure 3 Current De-rating

Figure 4 Power De-rating

Figure 5 Rdson- Drain Current

Figure 6 Rdson-Junction Temperature

N-Channel Enhancement Mode MOSFET

Figure 7 Gate Charge

Figure 8 Source- Drain Diode Forward

Figure 9 Capacitance vs Vds

Figure 10 Safe Operation Area

Figure 11 Normalized Maximum Transient Thermal Impedance

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


Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	1.35	1.55	1.75	A₁	0.10	0.18	0.25
A₂	1.25	1.45	1.65	A₃	--	0.25	--
b_p	0.36	0.42	0.51	c	0.19	0.22	0.25
D	4.70	4.92	5.10	E	3.80	3.90	4.00
e	--	1.27	--	H_E	5.80	6.00	6.20
L	--	1.05	--	L_p	0.40	0.68	1.00
Q	0.60	0.65	0.73	v	--	0.25	--
w	--	0.25	--	y	--	0.10	--
Z	0.30	0.50	0.70	θ	0°		8°