

## P-Channel Enhancement Mode MOSFET

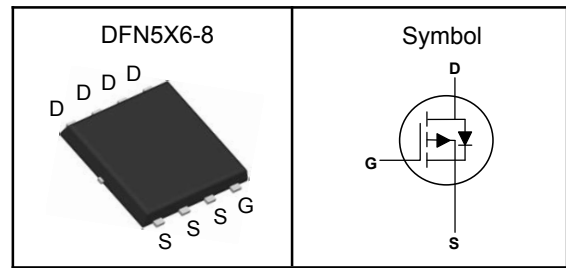
### Features

- Low  $R_{ds(on)}$  for low conduction loss
- Reliable and Rugged
- ROHS Compliant & Halogen-Free

### Applications

- Power Management in Desktop Computer
- DC/DC Converters

### Pin Description



$V_{bss}$	-30	V
$R_{ds(ON)-Typ}$	6.5	m $\Omega$
$I_D$	-67	A

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

Symbol	Parameter	P-Channel	Unit
$V_{bss}$	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	$^\circ\text{C}$
$I_{DM}^{①}$	Pulse Drain Current Tested	-141	A
$I_D$	Continuous Drain Current	-67	A
$P_D$	Maximum Power Dissipation	50	W
EAS	Single Pulse Avalanche Energy	55	mJ

### Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	50	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case	2.5	$^\circ\text{C}/\text{W}$

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  $1\text{in}^2$  FR-4 board with 1oz.



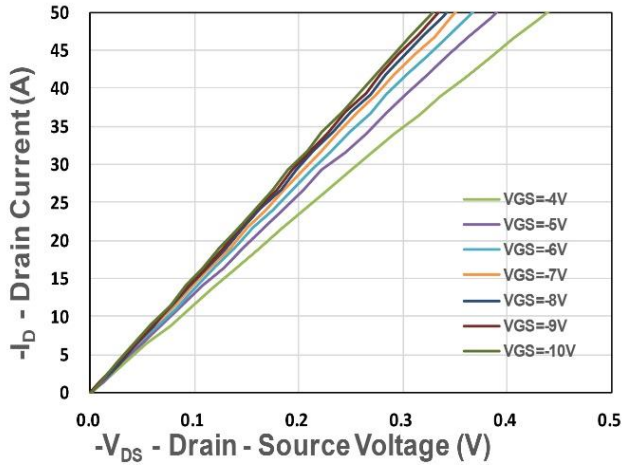
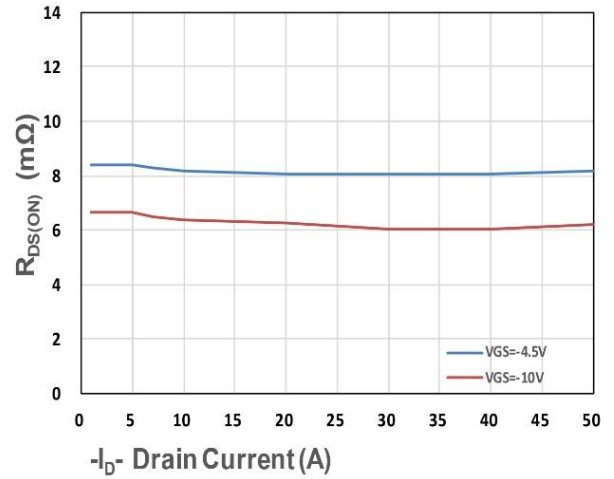
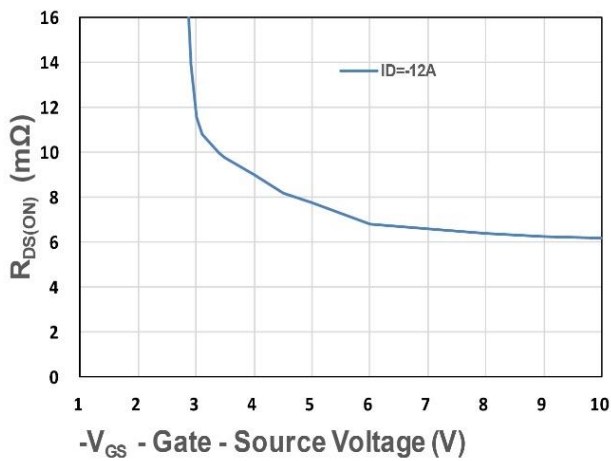
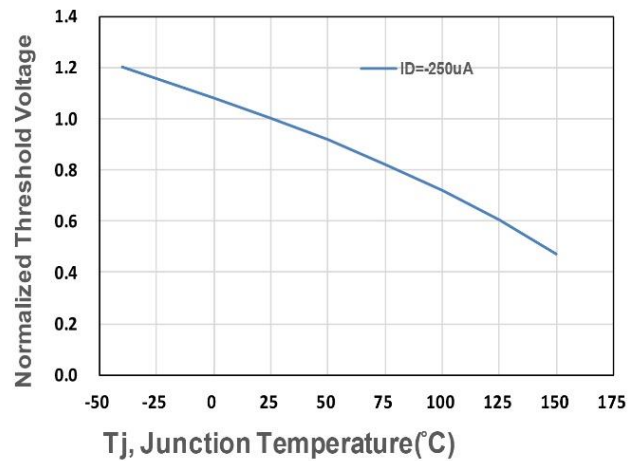
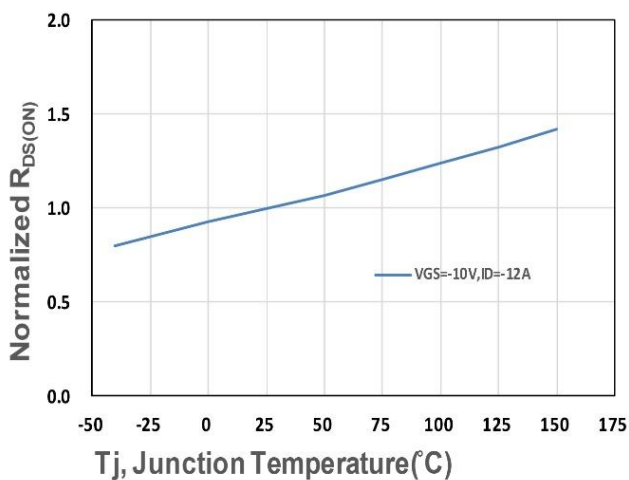
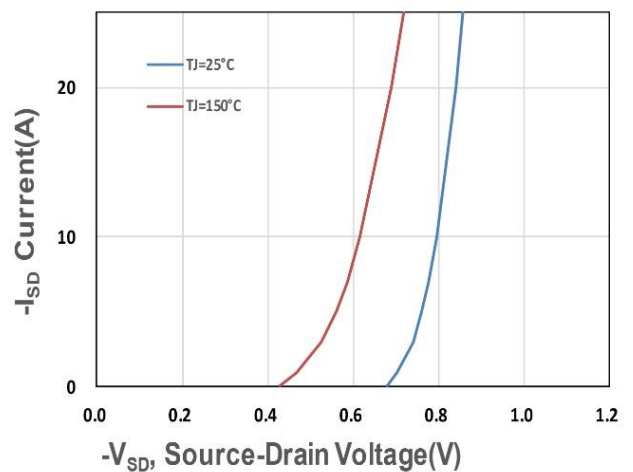
**P-Channel Enhancement Mode MOSFET**

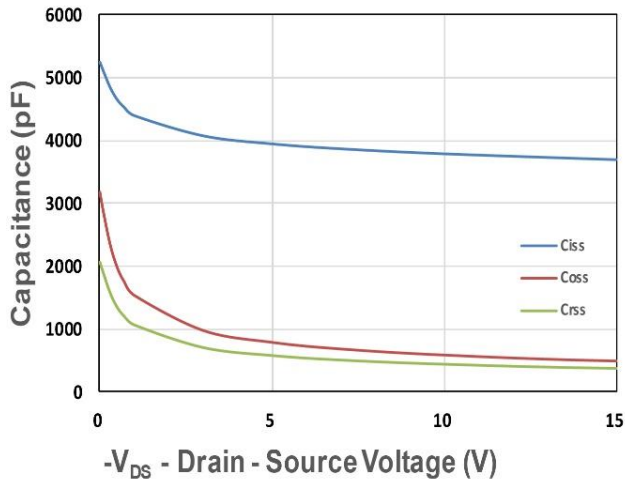
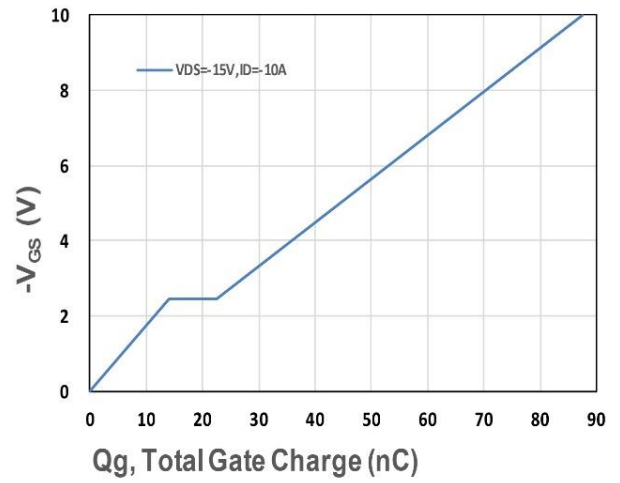
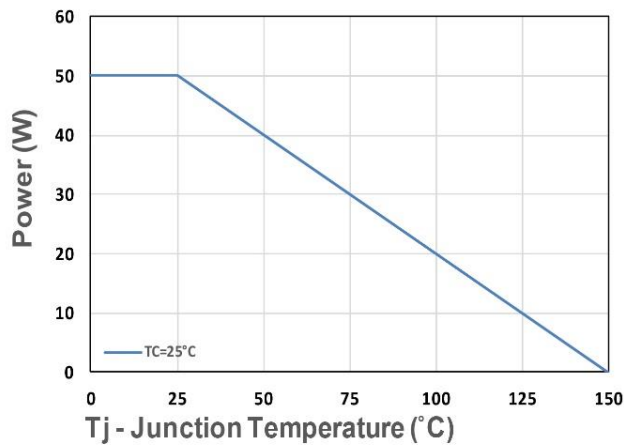
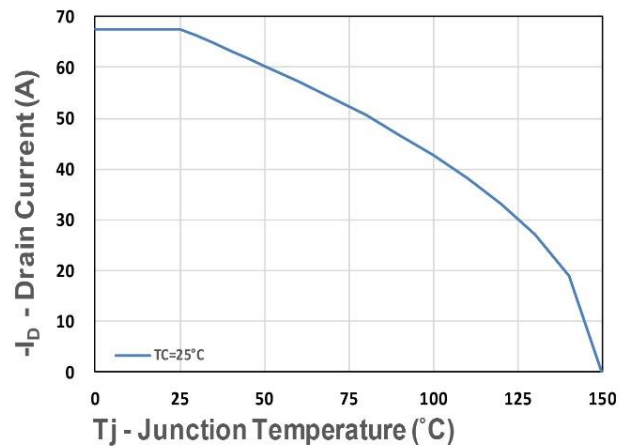
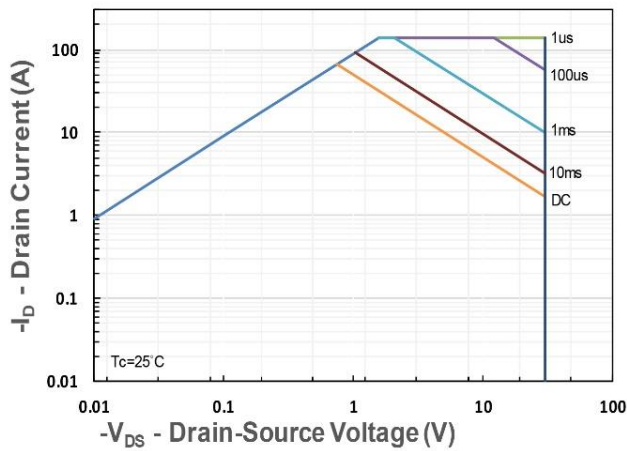
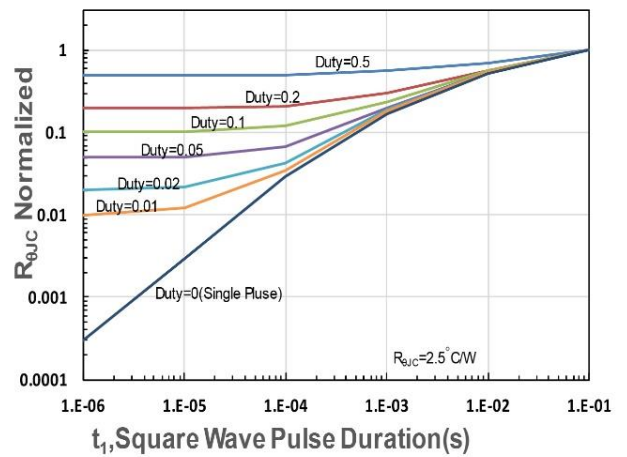
**Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$ , Unless Otherwise Noted)

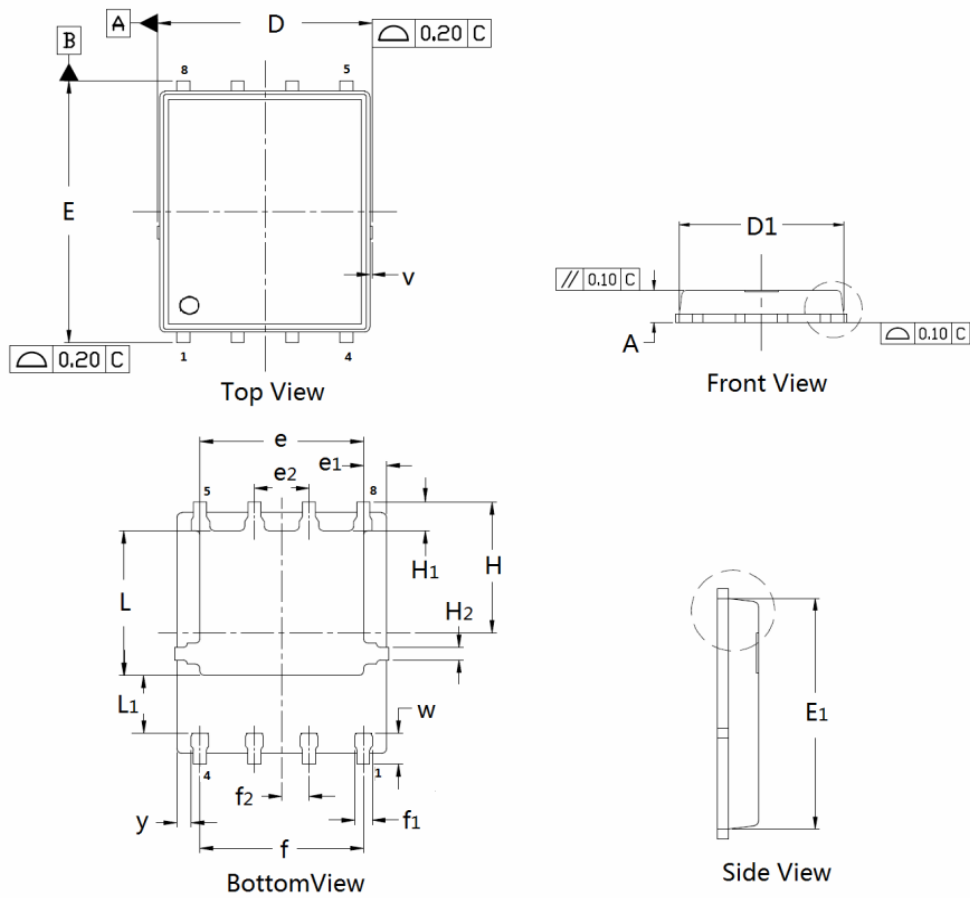
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
<b>Static Electrical Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-24V, V_{GS}=0V$	---	---	-1	$\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0	---	-2.0	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=-10V, I_D=-12A$	---	6.5	8.0	$m\Omega$
		$V_{GS}=-4.5V, I_D=-9A$	---	8.2	10.7	$m\Omega$
gfs	Forward Transconductance	$V_{DS}=-5V, I_D=-12A$	---	35	---	S
<b>Dynamic Characteristics</b> <sup>⑤</sup>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=-15V, \text{Freq.}=1\text{MHz}$	---	4430	---	pF
$C_{oss}$	Output Capacitance		---	500	---	
$C_{riss}$	Reverse Transfer Capacitance		---	473	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=-15V, V_{GS}=-10V, R_G=3\Omega, I_D=-1A$	---	51	---	nS
$T_r$	Turn-on Rise Time		---	40	---	
$T_{d(off)}$	Turn-off Delay Time		---	77	---	
$T_f$	Turn-off Fall Time		---	56	---	
$Q_g$	Total Gate Charge	$V_{DS}=-15V, V_{GS}=-10V, I_D=-10A$	---	88	---	nC
$Q_{gs}$	Gate-Source Charge		---	14	---	
$Q_{gd}$	Gate-Drain Charge		---	8.5	---	
<b>Source-Drain Characteristics</b> ( $T_J=25^{\circ}\text{C}$ )						
$V_{SD}^{④}$	Diode Forward Voltage	$V_{GS}=0V, I_S=-3.6A, T_J=25^{\circ}\text{C}$	---	-0.75	-1.1	V
$t_{rr}$	Reverse Recovery Time	$I_F=-3.6A, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	25	---	nS
$Q_{rr}$	Reverse Recovery Charge		---	15	---	nC

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

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

**P-Channel Enhancement Mode MOSFET**
**Typical Characteristics**

**Figure 1. Output Characteristics**

**Figure 2. On-Resistance vs. ID**

**Figure 3. On-Resistance vs. VGS**

**Figure 4. Gate Threshold Voltage**

**Figure 5. Drain-Source On Resistance**

**Figure 6. Source-Drain Diode Forward**

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**Figure 7. Capacitance**

**Figure 8. Gate Charge Characteristics**

**Figure 9. Power Dissipation**

**Figure 10. Drain Current**

**Figure 11. Safe Operating Area**

**Figure 12.  $R_{\theta JC}$  Transient Thermal Impedance**

**P-Channel Enhancement Mode MOSFET**
**DFN5×6 Package Outline Data**

**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 <sub>1</sub>	4.80	4.89	5.10	E	5.90	6.11	6.25
E <sub>1</sub>	5.65	5.74	5.95	e	3.72	3.80	3.92
e <sub>1</sub>	--	0.5	--	e <sub>2</sub>	--	1.	--
f	--	3.8	--	f <sub>1</sub>	0.31	0.37	0.51
f <sub>2</sub>	--	0.6	--	H	--	3.	--
H <sub>1</sub>	0.59	0.63	0.79	H <sub>2</sub>	0.26	0.28	0.32
L	3.35	3.45	3.65	L <sub>1</sub>	--	1.	--
v	--	0.1	--	w	0.64	0.68	0.84
y	--	0.3	--		--		--