

# N-Channel Enhancement Mode MOSFET

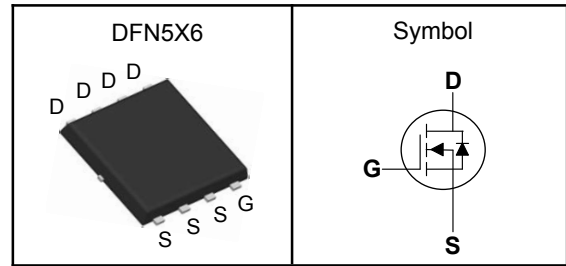
## Features

- 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
$R_{DS(ON)-Typ}$	2.2	m $\Omega$
$I_D$	120	A

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

Symbol	Parameter	Rating	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 <sub>3</sub> (L=0.1mH)	320	mJ	
$I_{DM}^{①}$	Pulse Drain Current Tested	280	A	
$I_D$	Continuous Drain Current	$T_C=25^\circ\text{C}$	120	A
$I_D$	Continuous Drain Current	$T_A=25^\circ\text{C}$	22.8	A
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	56	W
$P_D$	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	2.08	W

## Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sub>1</sub> (Steady State)	62	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case <sub>1</sub> (Steady State)	3.5	$^\circ\text{C/W}$

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

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

Note ③ : Surface Mounted on 1in<sup>2</sup> FR-4 board with 1oz.



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**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	$V_{GS}=0V, I_D=250mA$	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	---	2.5	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 10$	$\mu A$
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=20A$	---	2.2	3	$m\Omega$
		$V_{GS}=4.5V, I_D=15A$	---	3	4	$m\Omega$
$G_{fs}$	Forward Transconductance	$V_{DS}=5V, I_D=15A$	---	30	---	S
<b>Dynamic Characteristics</b> <sup>⑤</sup>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=15V, \text{Freq.}=1MHz$	---	1860	---	pF
$C_{oss}$	Output Capacitance		---	920	---	
$C_{rss}$	Reverse Transfer Capacitance		---	92	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=15V, R_L=15\Omega, I_{DS}=1A, V_{GEN}=10V, R_G=6\Omega$	---	15	---	nS
$T_r$	Turn-on Rise Time		---	8	---	
$T_{d(off)}$	Turn-off Delay Time		---	38	---	
$T_f$	Turn-off Fall Time		---	54	---	
$Q_g$	Total Gate Charge	$V_{DS}=15V, V_{GS}=4.5V, I_{DS}=20A$	---	14	---	nC
$Q_{gs}$	Gate-Source Charge		---	5.3	---	
$Q_{gd}$	Gate-Drain Charge		---	3.6	---	
<b>Source-Drain Characteristics</b> ( $T_J=25^{\circ}\text{C}$ )						
$V_{SD}$	Diode Forward Voltage <sub>z</sub>	$V_{GS}=0V, I_S=20A, T_J=25^{\circ}\text{C}$	---	0.8	1.1	V
$t_{rr}$	Reverse Recovery Time	$I_S=5A, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	39	---	nS
$Q_{rr}$	Reverse Recovery Charge		---	33	---	nC

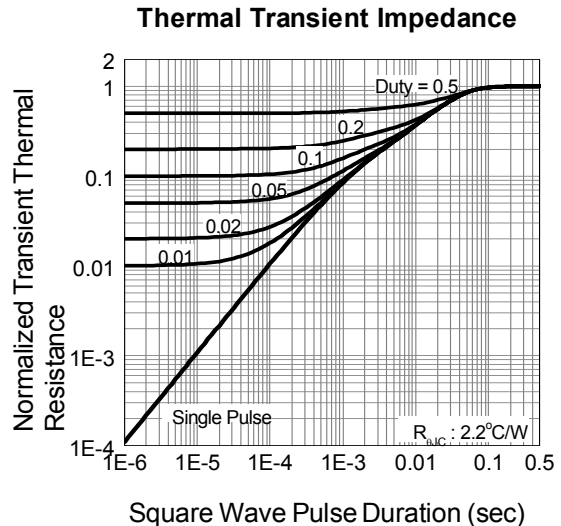
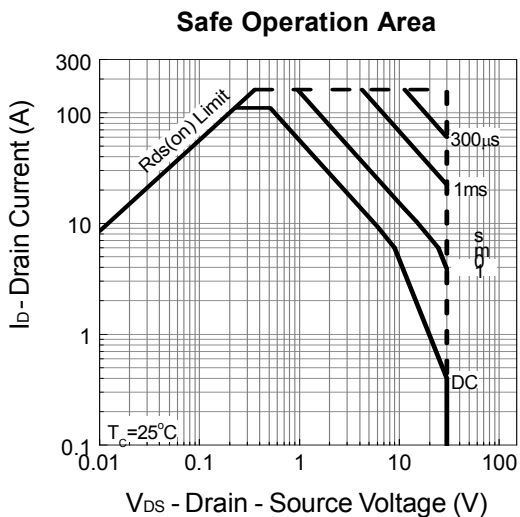
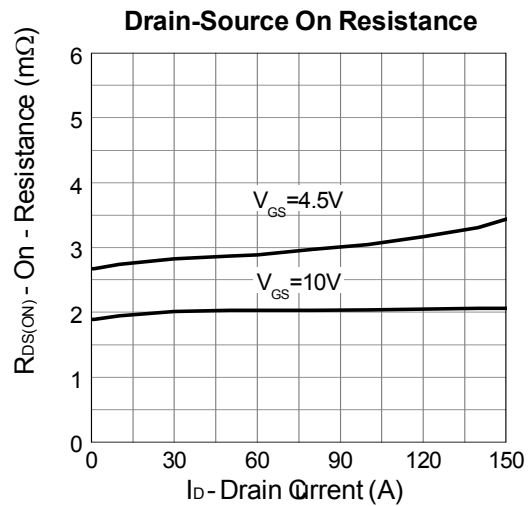
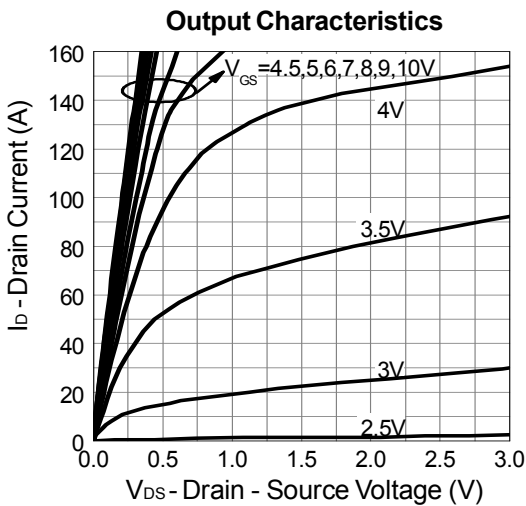
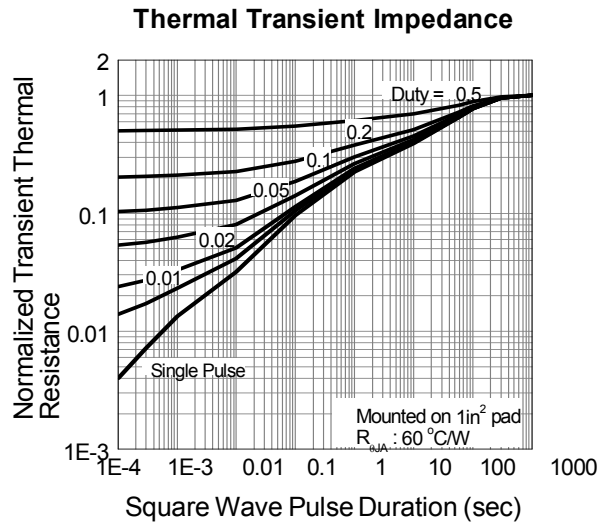
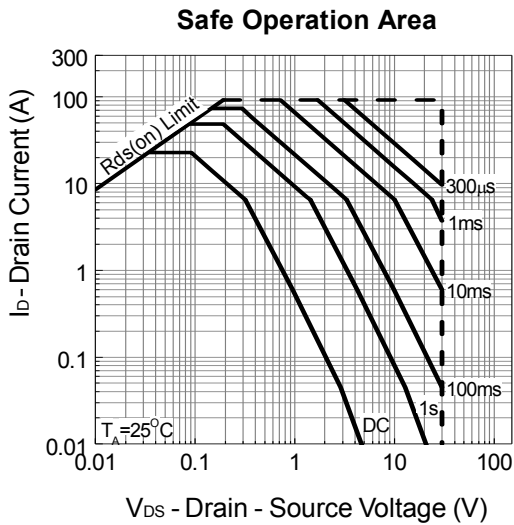
Note ④ : Pulse test (pulse width $\leq$ 300us, duty cycle $\leq$ 2%).

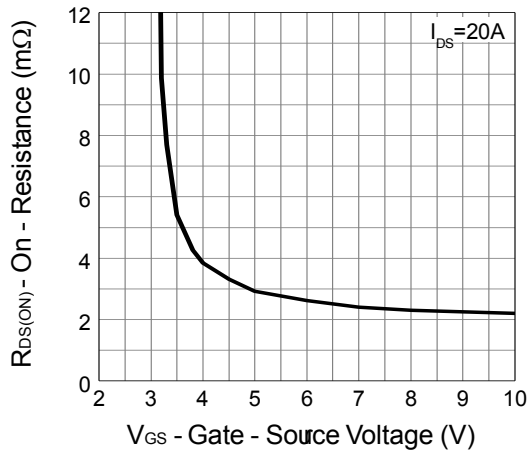
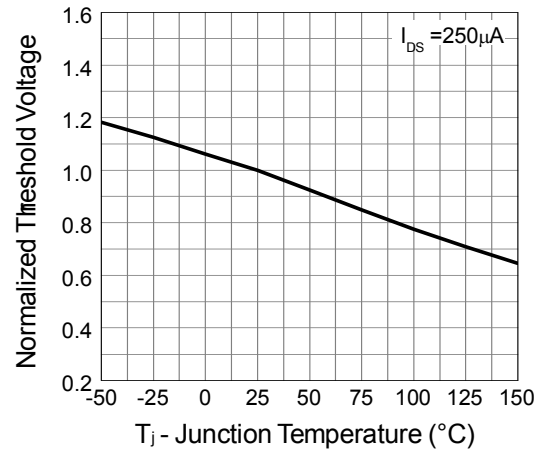
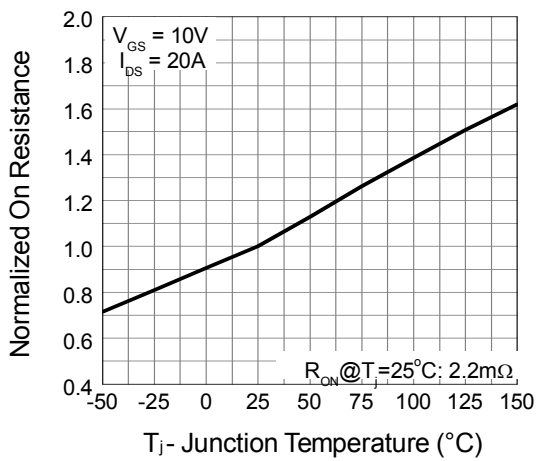
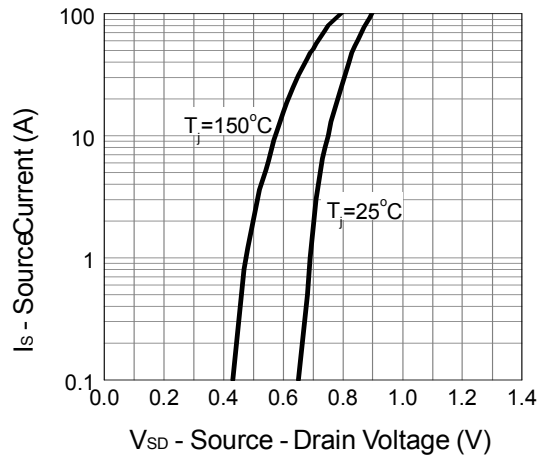
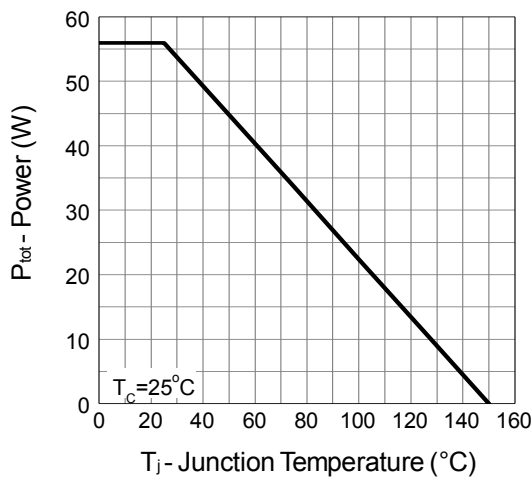
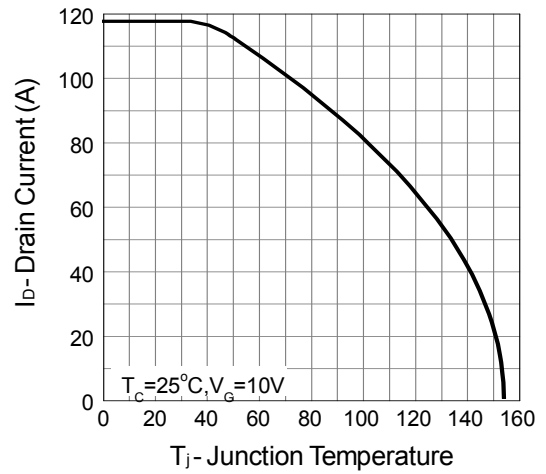
Note ⑤ : Guaranteed by design, not subject to production testing.

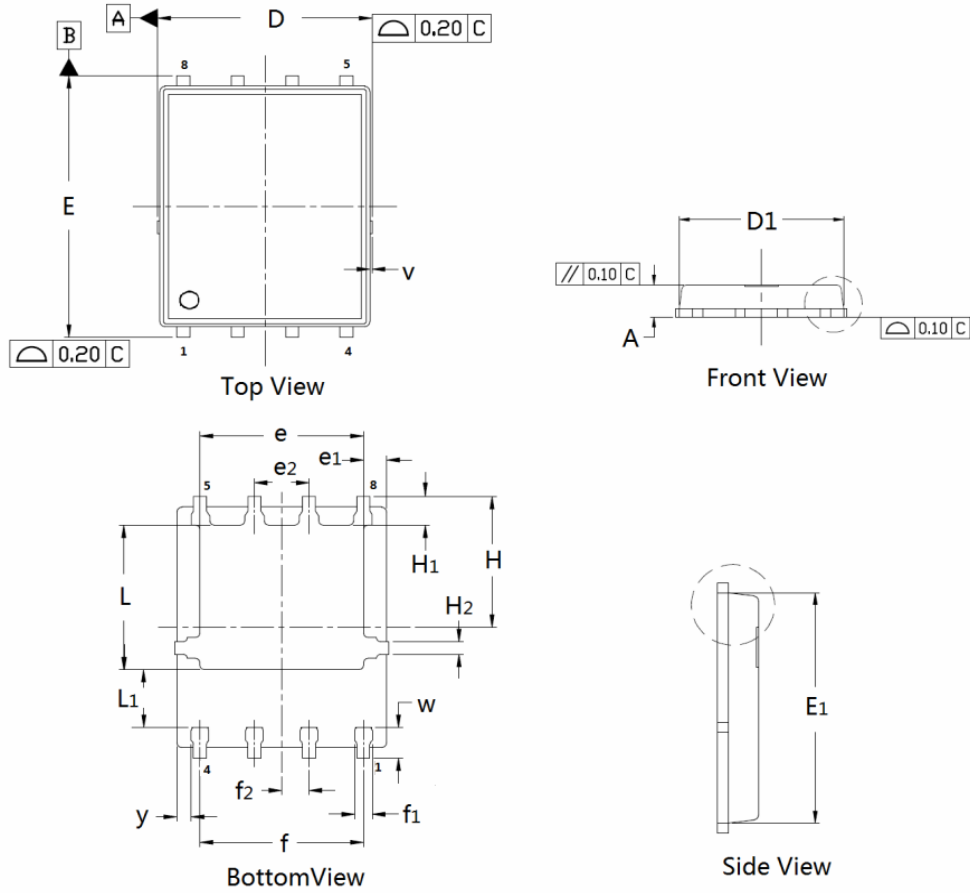


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## Typical Characteristics



**N-Channel Enhancement Mode MOSFET**
**Gate-Source  $\Omega$  Resistance**

**Gate Threshold Voltage**

**Drain-Source On Resistance**

**Source-Drain Diode Forward**

**Power Dissipation**

**Drain Current**


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

**DIMENSIONS ( unit : mm )**

Symbol	Typ	Max	Symbol	Min	Typ	Max
<b>A</b>	0.90	1.02	<b>D</b>	4.90	4.98	5.10
<b>D<sub>1</sub></b>	4.80	4.89	<b>E</b>	5.90	6.11	6.25
<b>E<sub>1</sub></b>	5.65	5.74	<b>e</b>	3.72	3.80	3.92
<b>e<sub>1</sub></b>	--	0.5	<b>e<sub>2</sub></b>	--	1.	--
<b>f</b>	--	3.8	<b>f<sub>1</sub></b>	0.31	0.37	0.51
<b>f<sub>2</sub></b>	--	0.6	<b>H</b>	--	3.	--
<b>H<sub>1</sub></b>	0.59	0.63	<b>H<sub>2</sub></b>	0.26	0.28	0.32
<b>L</b>	3.35	3.45	<b>L<sub>1</sub></b>	--	1.	--
<b>v</b>	--	0.1	<b>w</b>	0.64	0.68	0.84
<b>y</b>	--	0.3		--		--