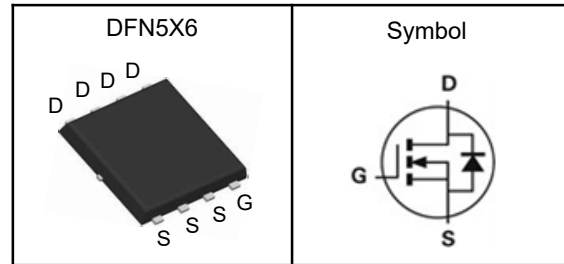


**N-Channel Enhancement Mode MOSFET**
**Features**

- High Speed Power Switching
- Reliable and Rugged
- ROHS Compliant
- 100% Avalanche Tested

**Applications**

- Power Management in Desktop Computer
- DC/DC Converters

**Pin Description**


$V_{DSS}$	60	V
$R_{DS(ON)-Typ}$	7	m $\Omega$
$I_D$	68	A

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

Symbol	Parameter	Rating	Unit
$V_{DSS}$	Drain-Source Voltage	60	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	204	A
$I_D$	Continuous Drain Current	68	A
$P_D$	Maximum Power Dissipation	81	W
$E_{AS}$	Avalanche Energy, Single pulse	91	mJ

**Thermal Characteristics**

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	62	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.54	$^{\circ}C/W$

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.



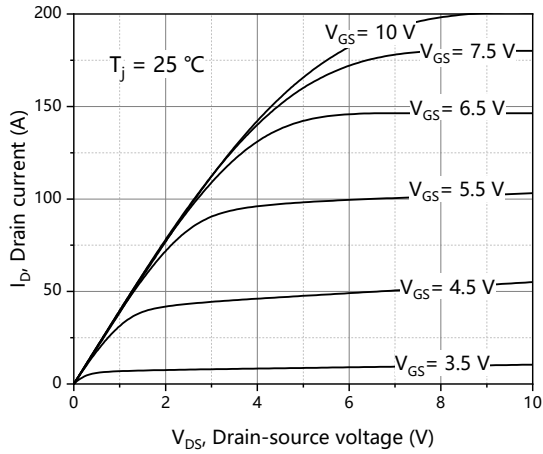
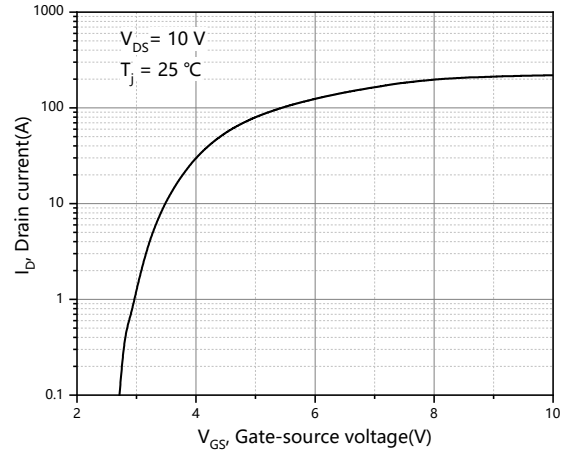
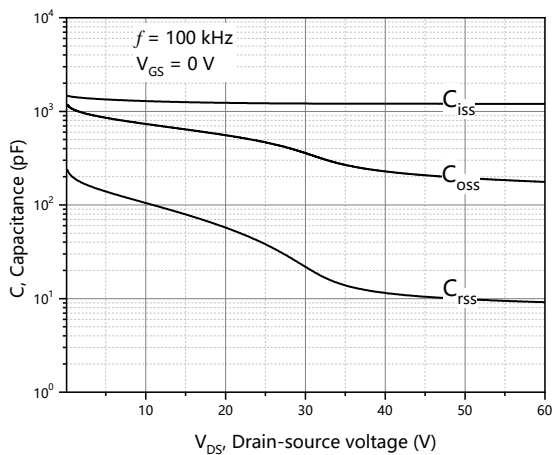
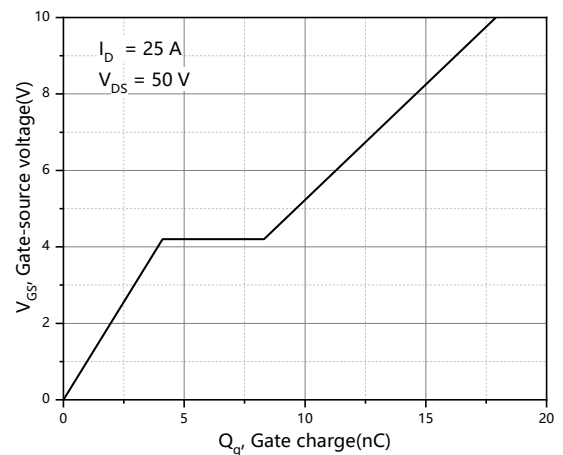
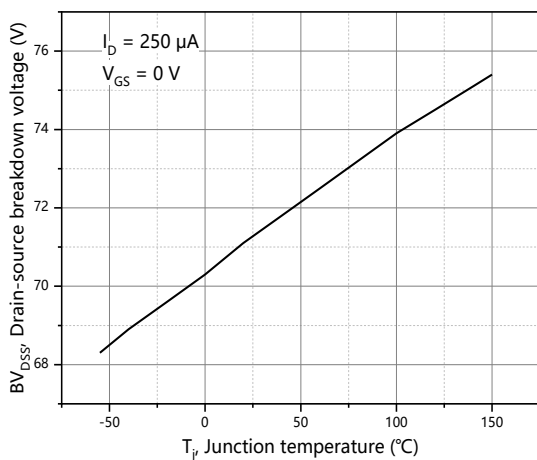
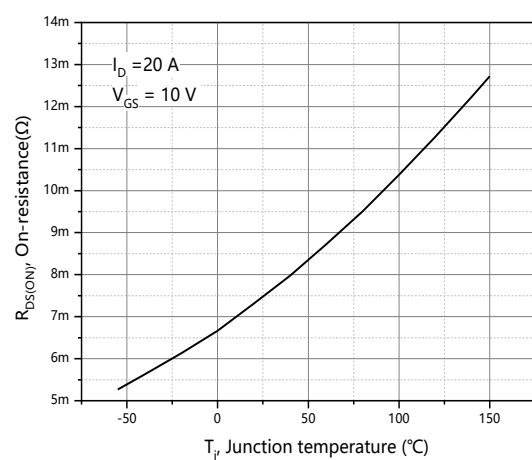
**N-Channel Enhancement Mode MOSFET**

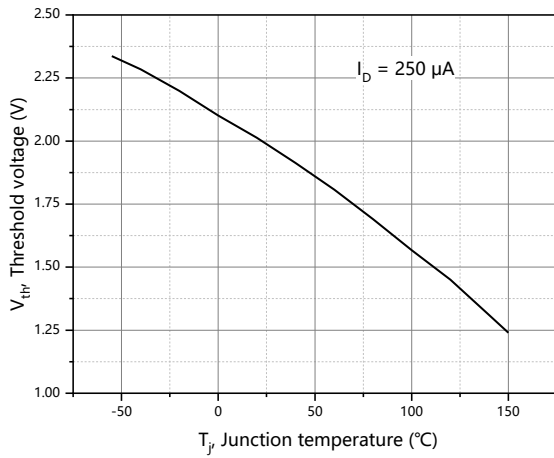
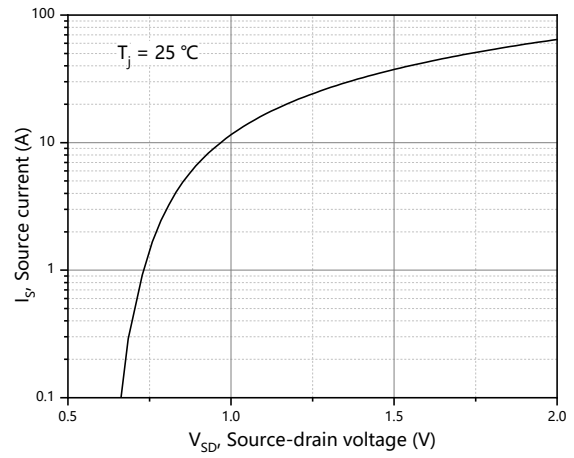
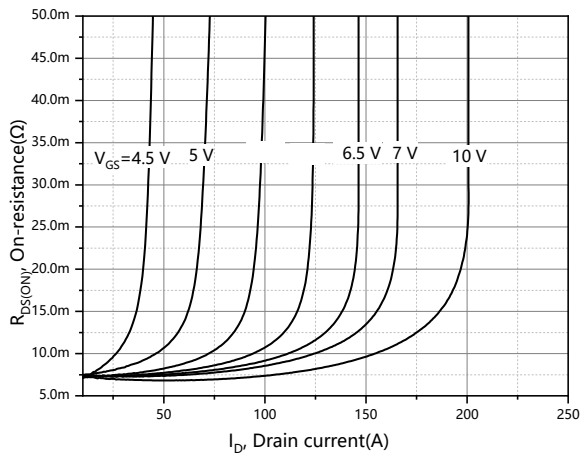
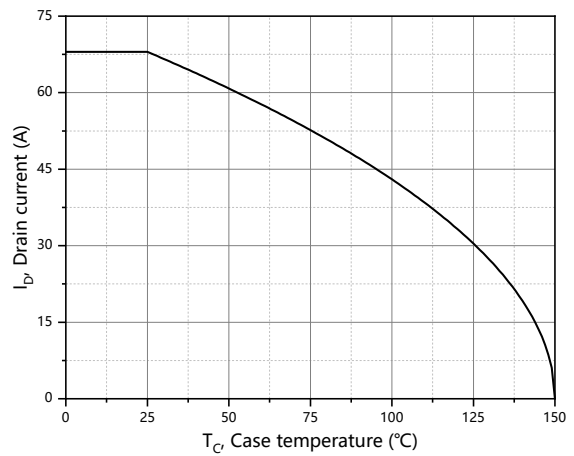
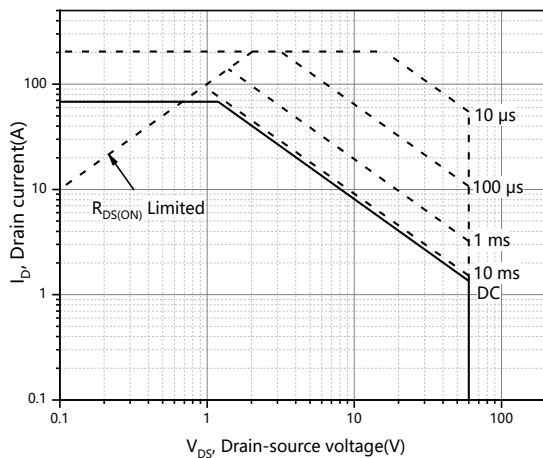
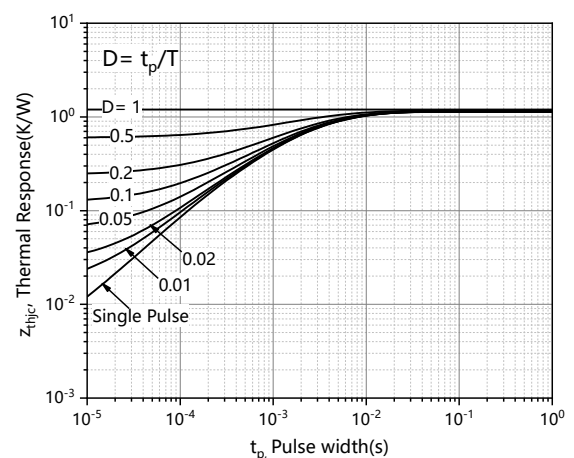
**Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$ , Unless Otherwise Noted)

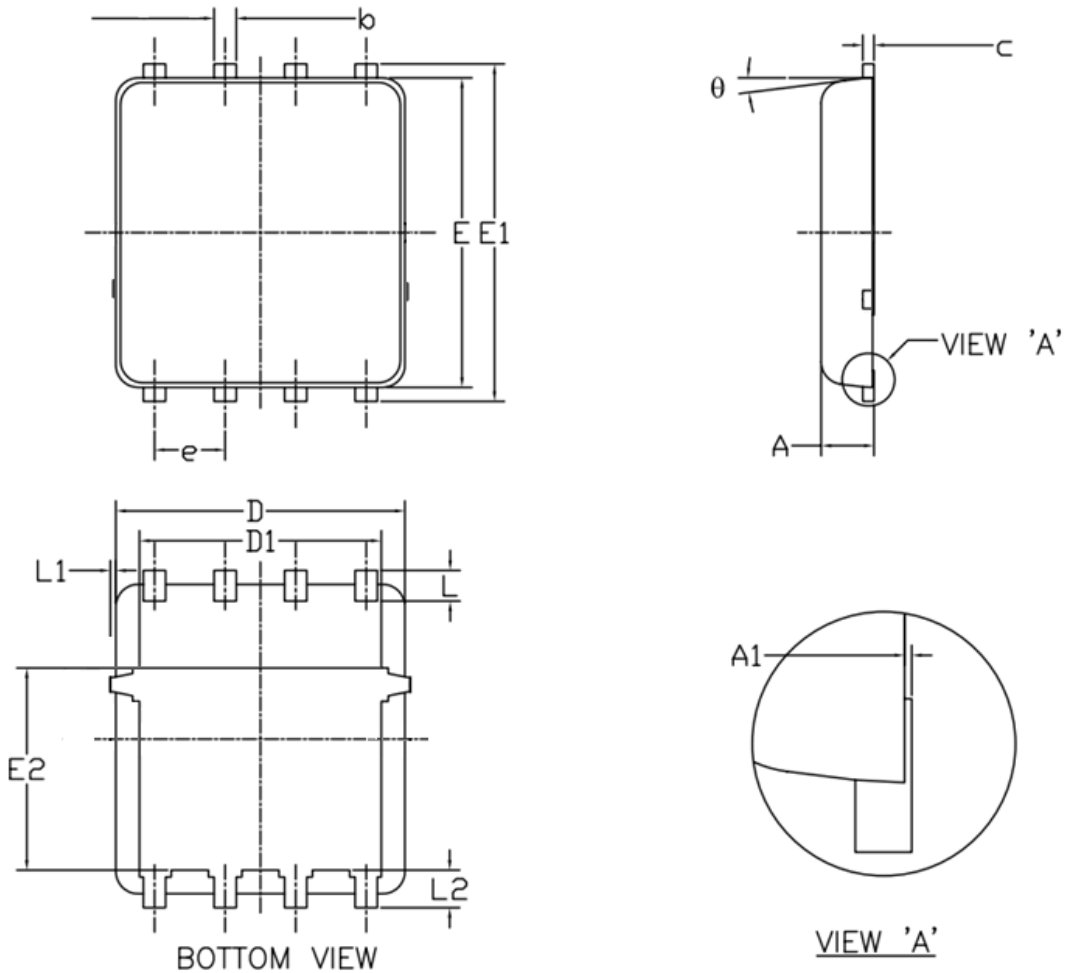
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
<b>Static Electrical Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=60V, V_{GS}=0V$	---	---	1	$\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	---	2.5	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=20A$	---	7.0	9.0	m $\Omega$
		$V_{GS}=4.5V, I_D=10A$	---	10	14	m $\Omega$
<b>Dynamic Characteristics</b> <sup>⑤</sup>						
$R_g$	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	---	---	---	$\Omega$
$C_{iss}$	Input Capacitance	$V_{DS}=50V, V_{GS}=0V, \text{Freq.}=1MHz$	---	1204	---	pF
$C_{oss}$	Output Capacitance		---	194	---	
$C_{rss}$	Reverse Transfer Capacitance		---	9.9	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=50V, V_{GS}=10V, I_D=25A, R_G=2\Omega$	---	23.9	---	nS
$T_r$	Turn-on Rise Time		---	4.6	---	
$T_{d(off)}$	Turn-off Delay Time		---	37.8	---	
$T_f$	Turn-off Fall Time		---	6.4	---	
$Q_g$	Total Gate Charge	$V_{DS}=50V, V_{GS}=10V, I_D=25A$	---	17.9	---	nC
$Q_{gs}$	Gate-Source Charge		---	3.8	---	
$Q_{gd}$	Gate-Drain Charge		---	4.2	---	
<b>Source-Drain Characteristics</b>						
$V_{SD}$	Diode Forward Voltage	$I_S=20A, V_{GS}=0V$	---	---	1.3	V
$t_{rr}$	Reverse Recovery Time	$I_F=25A, di_F/dt=100A/\mu s$	---	42	---	nS
$Q_{rr}$	Reverse Recovery Charge		---	36	---	nC

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**

**Figure 1. Typ. output characteristics**

**Figure 2. Typ. transfer characteristics**

**Figure 3. Typ. capacitances**

**Figure 4. Typ. gate charge**

**Figure 5. Drain-source breakdown voltage**

**Figure 6. Drain-source on-state resistance**

**N-Channel Enhancement Mode MOSFET**

**Figure 7. Threshold voltage**

**Figure 8. Forward characteristic of body diode**

**Figure 9. Drain-source on-state resistance**

**Figure 10. Drain current**

**Figure 11, Safe operation area T<sub>C</sub>=25 °C**

**Figure 12, Max. transient thermal impedance**

**N-Channel Enhancement Mode MOSFET**
**DFN5X6-8L Package Outline Dimensions**


Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
<b>A</b>	0.90	1.00	1.20	<b>E1</b>	5.90	6.10	6.35
<b>A1</b>	0.00	--	0.05	<b>E2</b>	3.38	3.58	3.92
<b>b</b>	0.30	0.40	0.51	<b>e</b>	1.27 BSC		
<b>c</b>	0.20	0.25	0.33	<b>L</b>	0.51	0.61	0.71
<b>D</b>	4.80	4.90	5.40	<b>L1</b>	--	--	0.15
<b>D1</b>	3.61	4.00	4.25	<b>L2</b>	0.41	0.51	0.61
<b>E</b>	5.65	5.80	6.06	<b>θ</b>	0°	--	12°