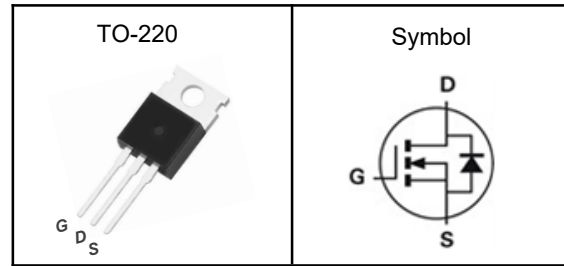


**N-Channel Enhancement Mode MOSFET**
**Features**

- 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
$R_{DS(ON)-Typ}$	2.8	m $\Omega$
$I_D$	176	A

**Absolute Maximum Ratings**( $T_J=25^\circ\text{C}$ , 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	$^\circ\text{C}$
$I_{DM}^{①}$	Pulse Drain Current Tested	$T_C=25^\circ\text{C}$	350	A
$I_D$	Continuous Drain Current	$T_C=25^\circ\text{C}$	176	A
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	120	W
$I_{AS}^{②}$	Avalanche Current, Single pulse	$L=0.5\text{mH}$	---	A
$E_{AS}^{②}$	Avalanche Energy, Single pulse	$L=0.5\text{mH}$	---	mJ

**Thermal Characteristics**

Symbol	Parameter	Rating	Unit
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	25	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.1	$^\circ\text{C}/\text{W}$

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

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

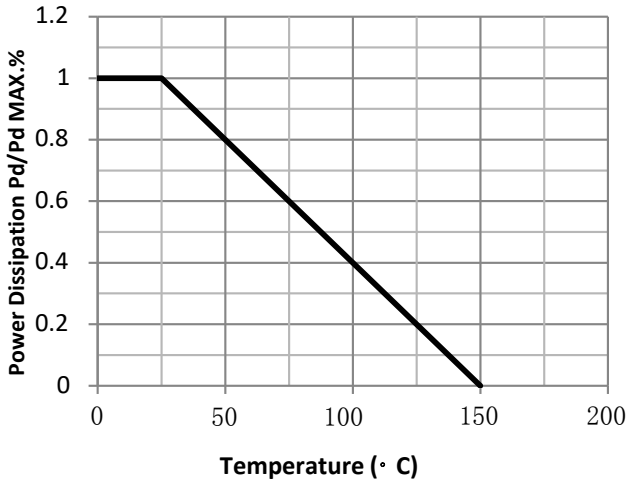
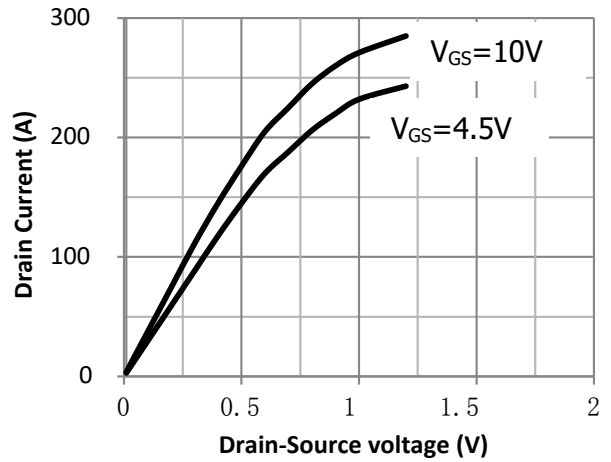
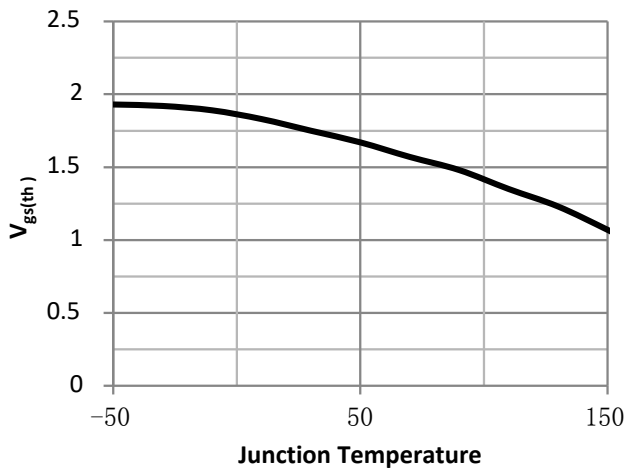
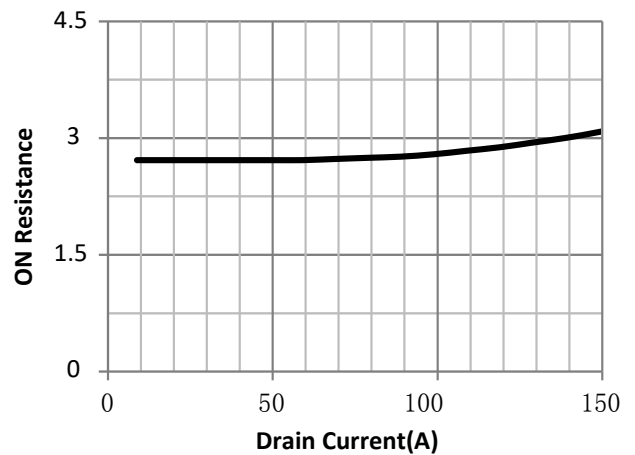
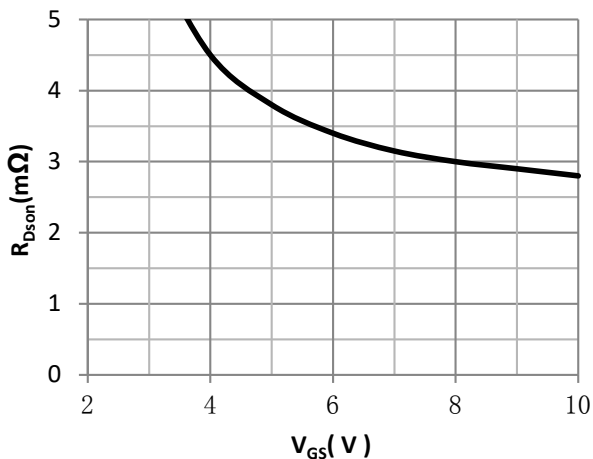
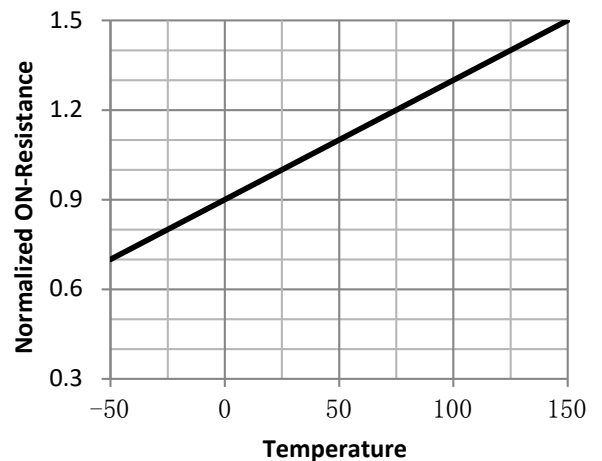
Note ③ : Surface Mounted on  $1\text{in}^2$  FR-4 board with 1oz.

**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	$V_{GS}=0V, I_D=250\mu A$	30	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$	---	---	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
gfs	Forward Transconductance	$V_{DS}=10V, I_D=10A$	---	40	---	S
$R_{DS(ON)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=24A$	---	2.8	3.5	$m\Omega$
		$V_{GS}=4.5V, I_D=12A$	---	4.0	5.0	$m\Omega$
<b>Dynamic Characteristics</b> <sup>⑤</sup>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V, V_{DS}=25V, \text{Freq.}=1\text{MHz}$	---	5200	---	pF
$C_{oss}$	Output Capacitance		---	650	---	
$C_{rss}$	Reverse Transfer Capacitance		---	500	---	
$Q_g$	Total Gate Charge	$V_{DD}=25V, V_{GS}=10V, I_D=30A$	---	104	---	nC
$Q_{gs}$	Gate-Source Charge		---	14	---	
$Q_{gd}$	Gate-Drain Charge		---	31	---	
<b>Source-Drain Characteristics</b>						
$V_{SD}$ <sup>④</sup>	Diode Forward Voltage	$I_S=24A, V_{GS}=0V$	---	0.85	1.28	V

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**
**Fig.1 Power Dissipation**

**Fig.2 Typical output Characteristics**

**Fig.3 Threshold Voltage V.S Junction Temperature**

**Fig.4 Resistance V.S Drain Current**

**Fig.5 On-Resistance VS Gate Source Voltage**

**Fig.6 On-Resistance V.S Junction Temperature**


**N-Channel Enhancement Mode MOSFET**

Fig.7 Switching Time Measurement Circuit

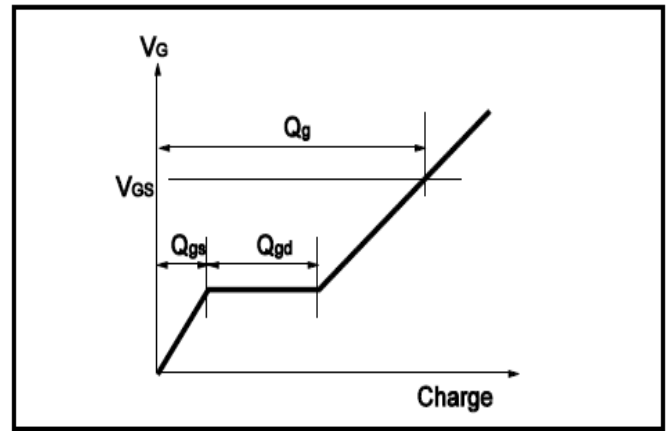
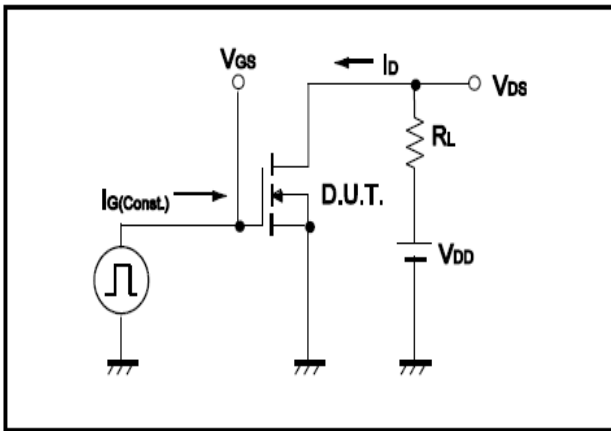


Fig.9 Switching Time Measurement Circuit

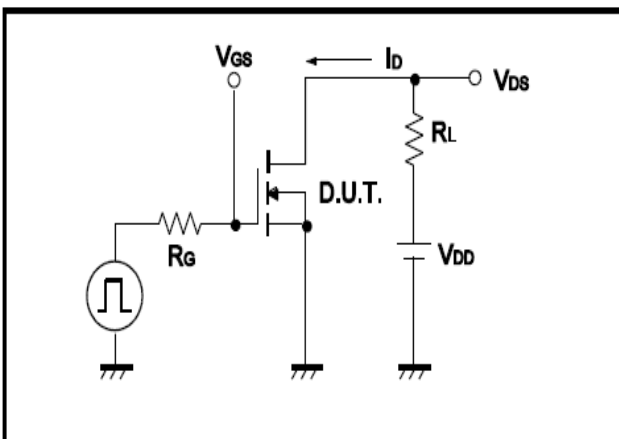


Fig.10 Gate Charge Waveform

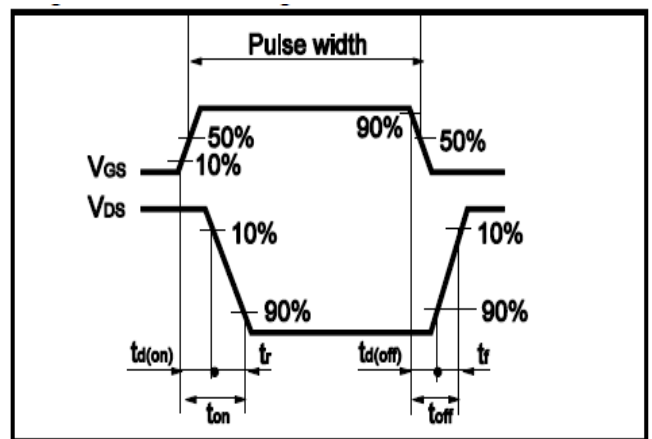


Fig.11 Avalanche Measurement Circuit

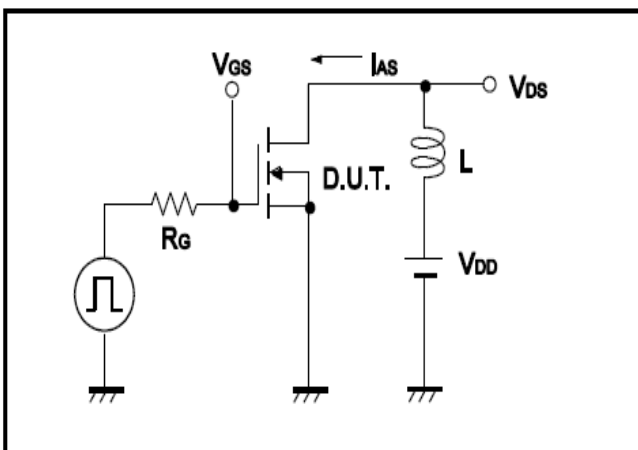
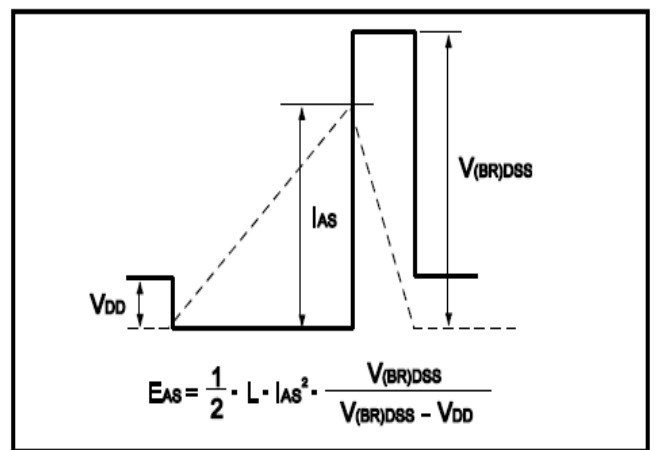
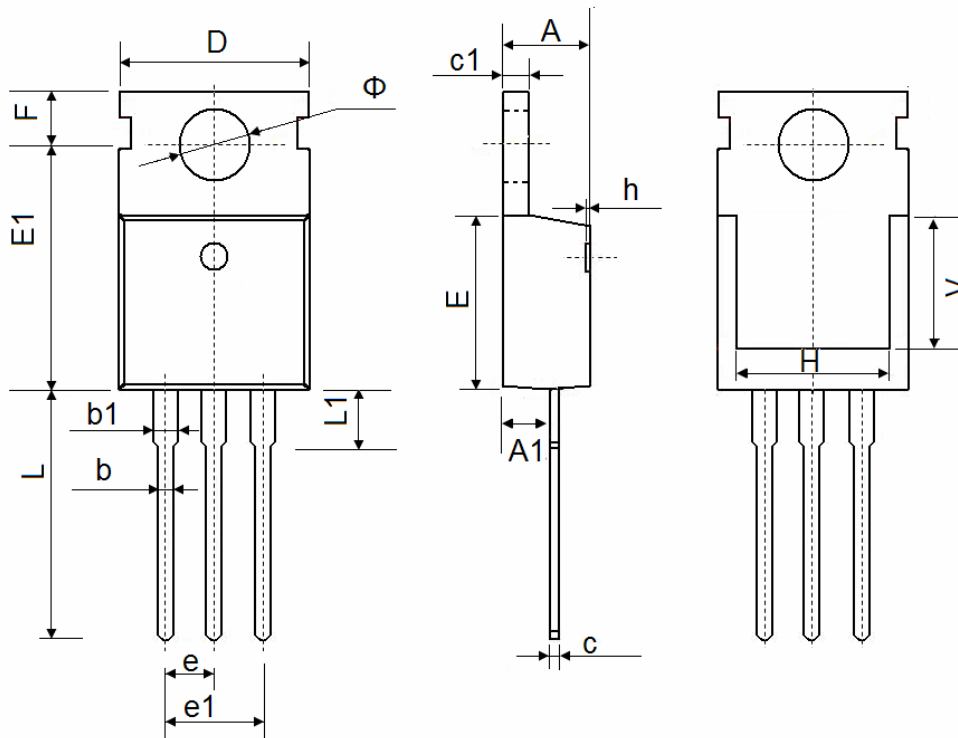


Fig.12 Avalanche Waveform



**N-Channel Enhancement Mode MOSFET**
**TO-220 Package Outline Data**


Symbol	Dimensions In Millimeters	
	Min.	Max.
A	4.10	4.60
A1	2.250	2.550
b	0.710	0.910
b1	1.170	1.160
c	0.330	0.650
c1	1.200	1.400
D	9.910	10.250
E	8.9500	9.750
E1	12.650	12.950
e	2.540 TYP.	
e1	4.980	5.180
F	2.650	2.950
H	7.900	8.100
h	0.000	0.300
L	12.100	13.100
L1	2.850	3.250
V	7.500 REF.	
Φ	3.400	3.800