

## N-Channel Enhancement Mode MOSFET

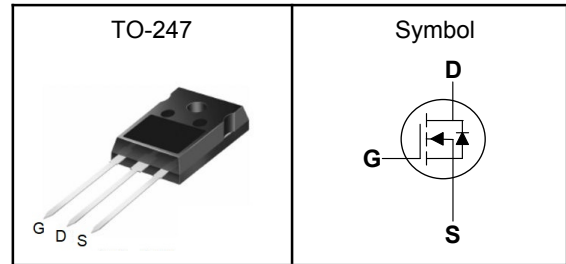
### Features

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

### Applications

- Power Management in Desktop Computer
- DC/DC Converters

### Pin Description



$V_{DSS}$	200	V
$R_{DS(ON)-Typ}$	23	m $\Omega$
$I_D$	80	A

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

Symbol	Parameter	N-Channel	Unit
$V_{DSS}$	Drain-Source Voltage	200	V
$V_{GSS}$	Gate-Source Voltage	$\pm 30$	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	320	A
$I_D$	Continuous Drain Current	80	A
$P_D$	Maximum Power Dissipation	390	W
$E_{AS}$	Avalanche Energy, Single pulse	2600	mJ

### Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	40	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.32	$^\circ\text{C/W}$

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.



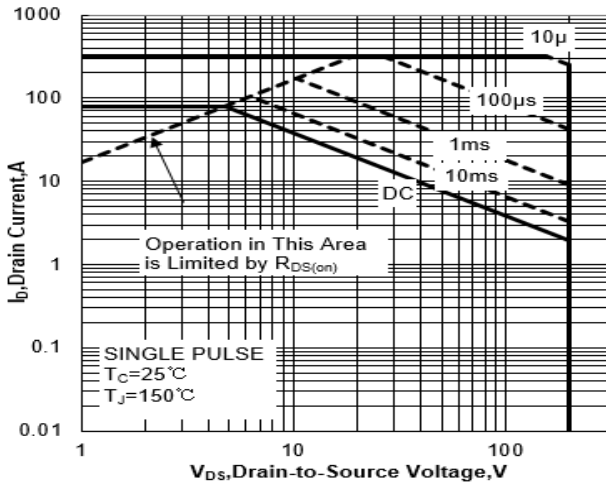
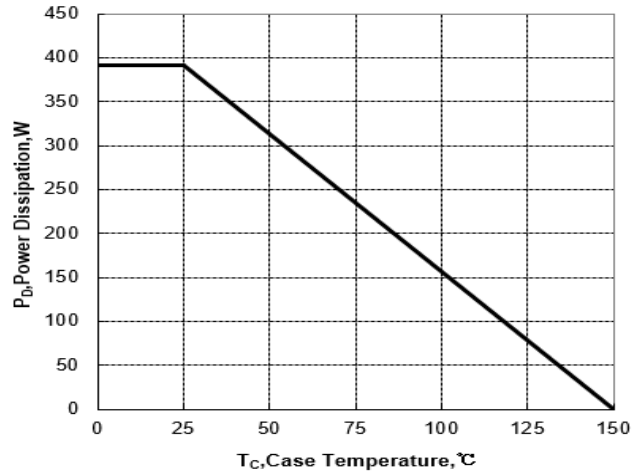
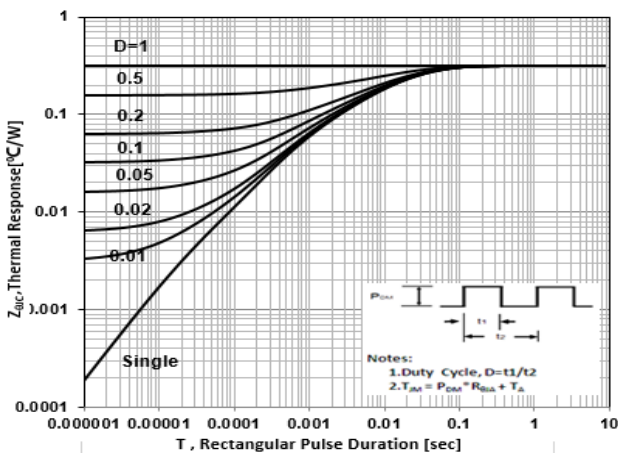
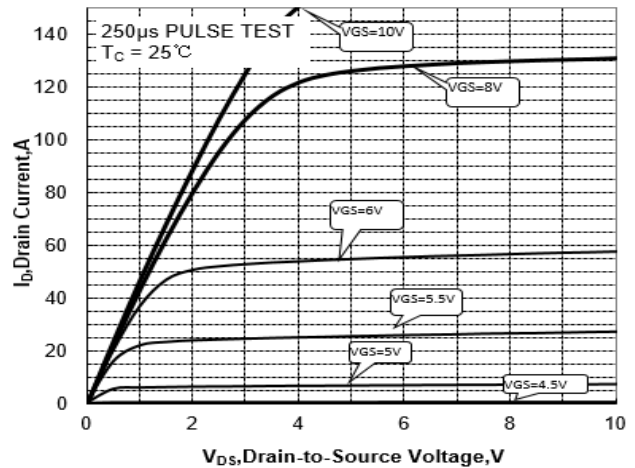
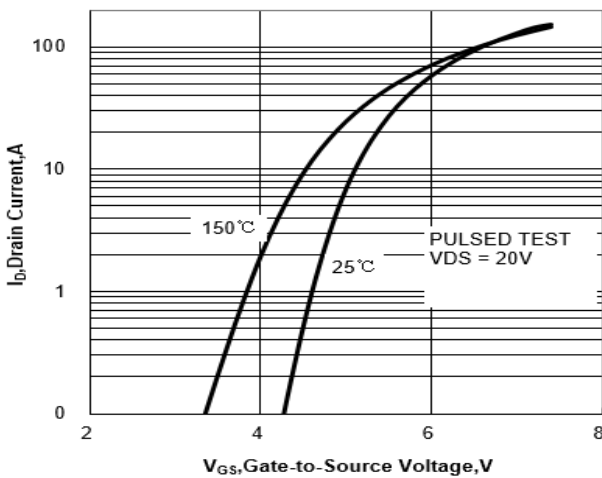
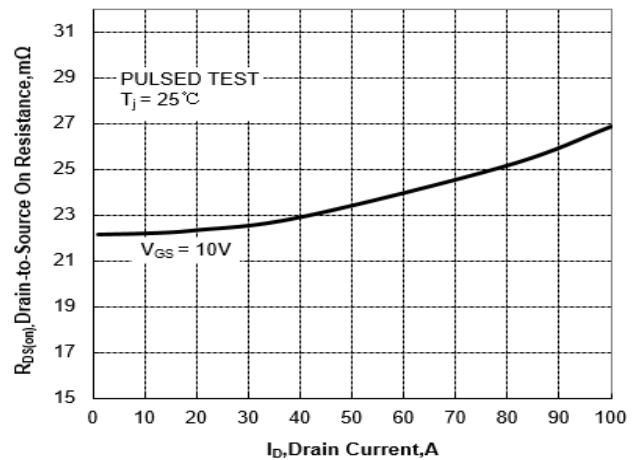
**N-Channel Enhancement Mode MOSFET**

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

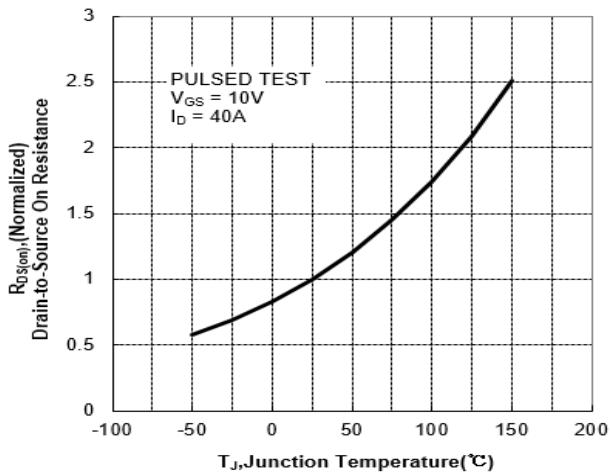
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
<b>Static Electrical Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	200	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=200V, V_{GS}=0V$	---	---	1	$\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	---	4	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$	---	---	$\pm 100$	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=40A$	---	23	28	m $\Omega$
<b>Dynamic Characteristics</b> <sup>⑤</sup>						
gfs	Forward Transconductance	$V_{DS}=15V, I_D=40A$	---	50	---	S
$R_g$	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	---	0.95	---	$\Omega$
$C_{iss}$	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, Freq.=1MHz$	---	9650	---	pF
$C_{oss}$	Output Capacitance		---	960	---	
$C_{rss}$	Reverse Transfer Capacitance		---	55	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=100V, V_{GS}=10V, I_D=80A, R_G=20\Omega$	---	60	---	nS
$T_r$	Turn-on Rise Time		---	245	---	
$T_{d(off)}$	Turn-off Delay Time		---	90	---	
$T_f$	Turn-off Fall Time		---	118	---	
$Q_g$	Total Gate Charge	$V_{DD}=160V, V_{GS}=10V, I_D=80A$	---	150	---	nC
$Q_{gs}$	Gate-Source Charge		---	56	---	
$Q_{gd}$	Gate-Drain Charge		---	38	---	
<b>Source-Drain Characteristics</b>						
$V_{SD}$	Diode Forward Voltage	$I_S=40A, V_{GS}=0V$	---	---	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_F=40A, V_{GS}=0V, di_F/dt=100A/\mu s$	---	190	---	nS
$Q_{rr}$	Reverse Recovery Charge		---	1850	---	nC

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

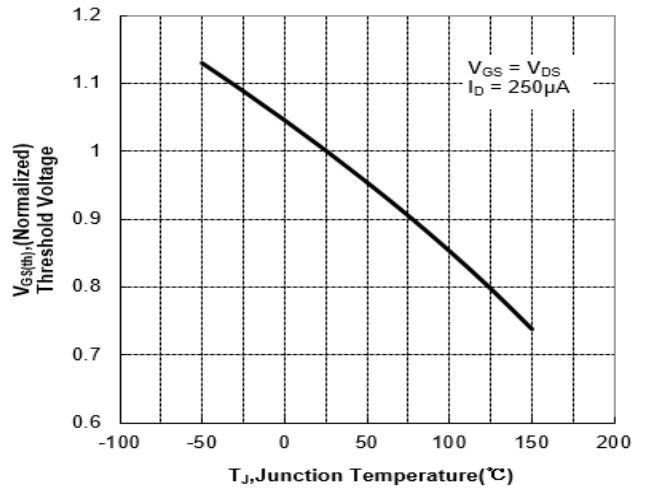
Note ⑤: Guaranteed by design, not subject to production testing.

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

**Figure 1a Safe Operating Area**

**Figure 2 Power Dissipation**

**Figure 3 Max Thermal Impedance**

**Figure 4 Typical Output Characteristics**

**Figure 5 Typical Transfer Characteristics**

**Figure 6 Typical Drain to Source ON Resistance vs Drain Current**

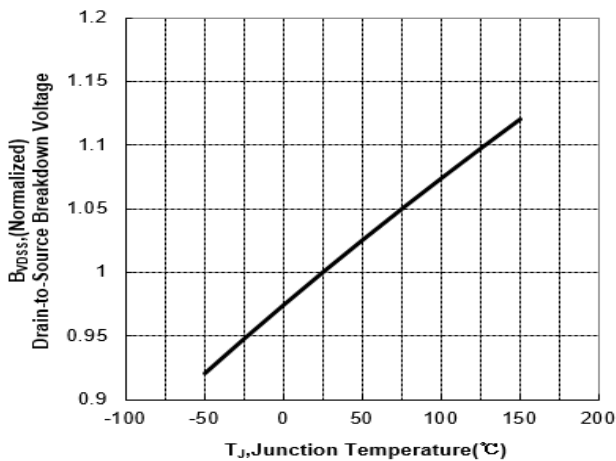
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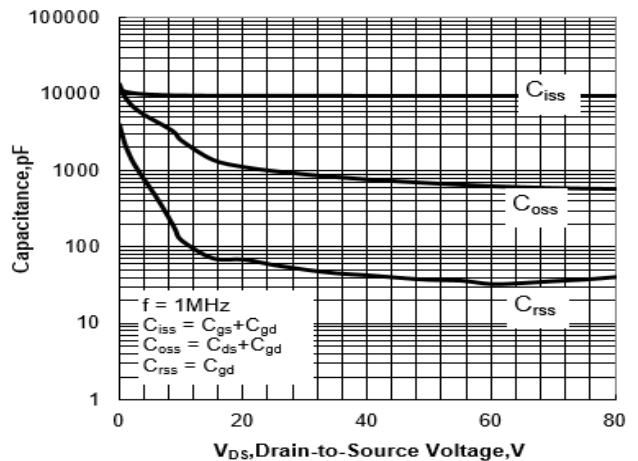
**Figure 7 Typical Drain to Source on Resistance vs Junction Temperature**



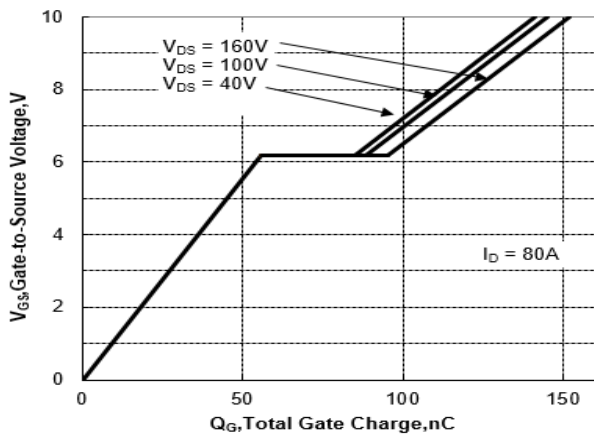
**Figure 8 Typical Threshold Voltage vs Junction Temperature**



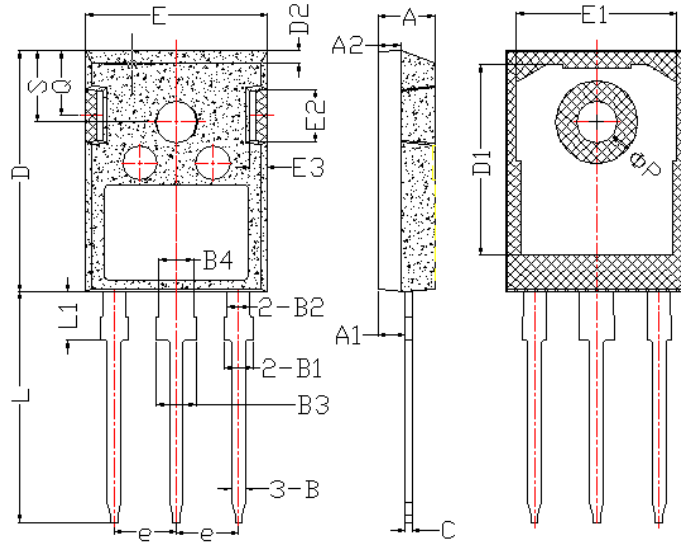
**Figure 9 Typical Breakdown Voltage vs Junction Temperature**



**Figure 10 Typical Capacitance vs Drain to Source Voltage**



**Figure 11 Typical Gate Charge vs Gate to Source Voltage**

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**TO-247 Package Outline Dimensions**


Items	Values(mm)	
	MIN	MAX
A	4.6	5.2
A1	2.2	2.6
B	0.9	1.4
B1	1.75	2.35
B2	1.75	2.15
B3	2.8	3.35
B4	2.8	3.15
C	0.5	0.7
D	20.60	21.30
D1	16	18
E	15.5	16.10
E1	13	14.7
E2	3.80	5.3
E3	0.8	2.60
e	5.2	5.7
L	19	20.5
L1	3.9	4.6
ΦP	3.3	3.70
Q	5.2	6.00
S	5.8	6.6