N-Channel Enhancement Mode MOSFET
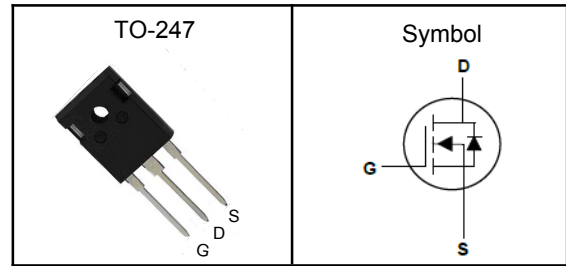
Features

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant
- 100% UIS and Rg Tested

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description

TO-247	Symbol

V_{DSS}	500	V
$R_{DS(ON)-Typ}$	0.08	Ω
I_D	45	A

Absolute Maximum Ratings(T$_J$=25℃, Unless Otherwise Noted)

Symbol	Parameter		N-Channel	Unit
V_{DSS}	Drain-Source Voltage		500	V
V_{GSS}	Gate-Source Voltage		±30	V
T_J	Maximum Junction Temperature		-55 to 150	℃
T_{STG}	Storage Temperature Range		-55 to 150	℃
E_{AS}	Single Pulse Avalanche Energy₃		500	mJ
I_{DM}[①]	Pulse Drain Current Tested		112	A
I_D	Continuous Drain Current	T_C=25°C	45	A
P_D	Maximum Power Dissipation	T_C=25°C	360	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient₁	62	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case₁	0.45	℃/W

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

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150℃.
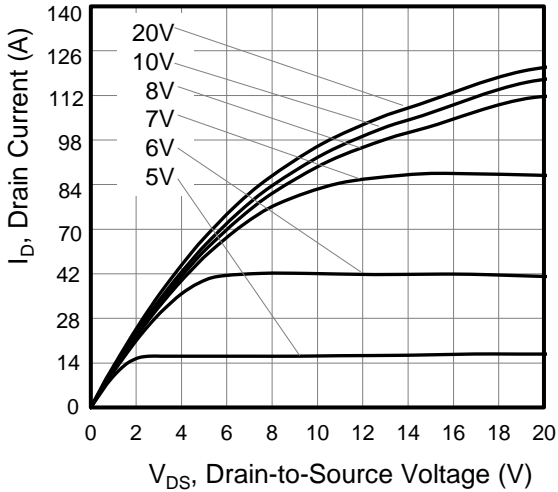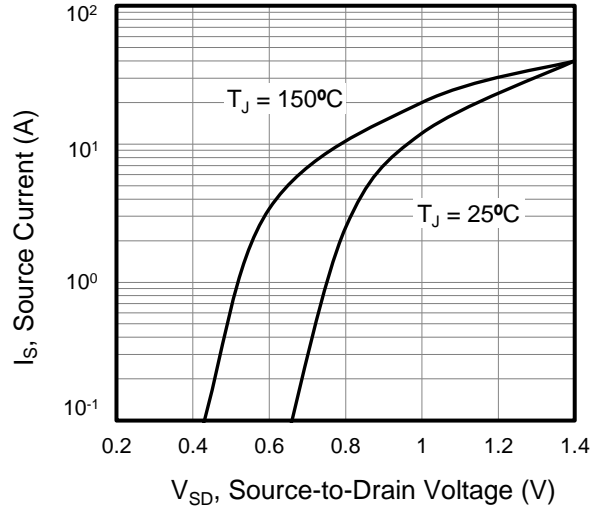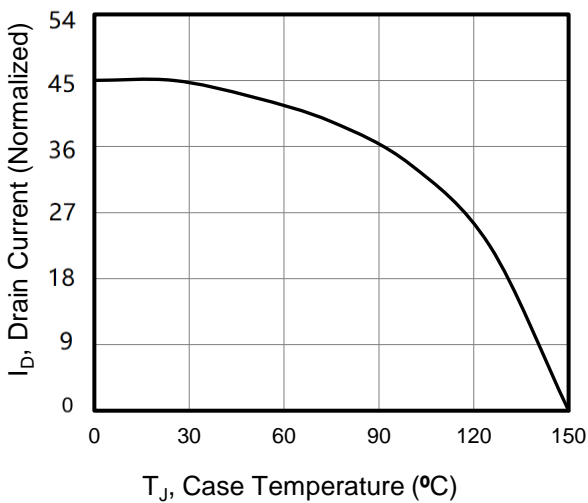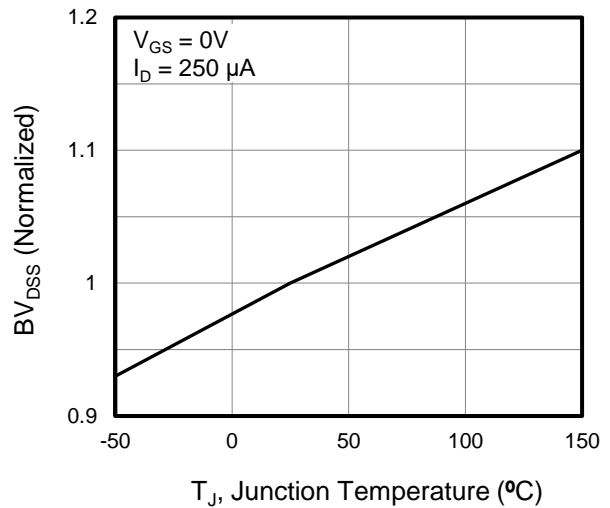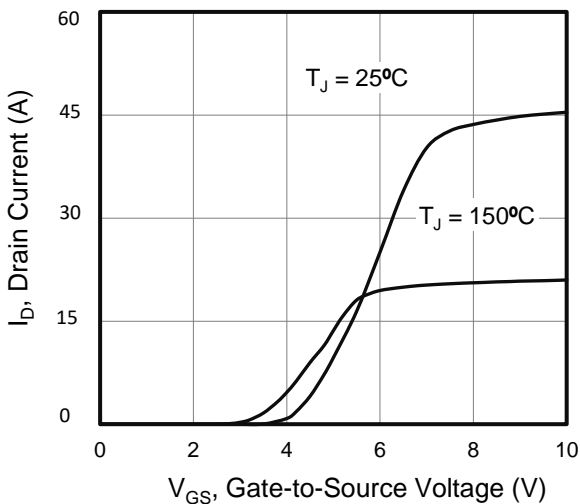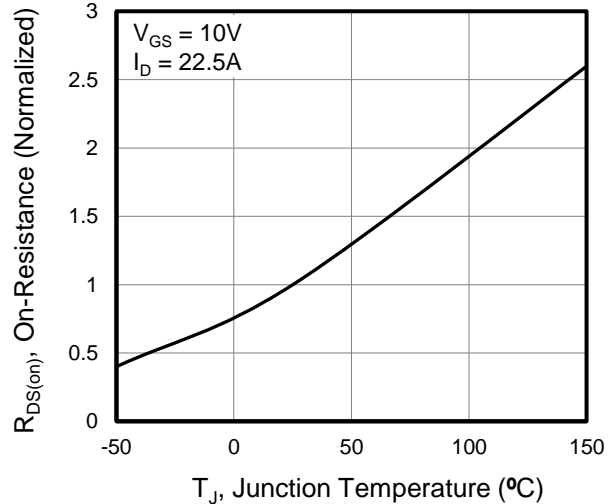
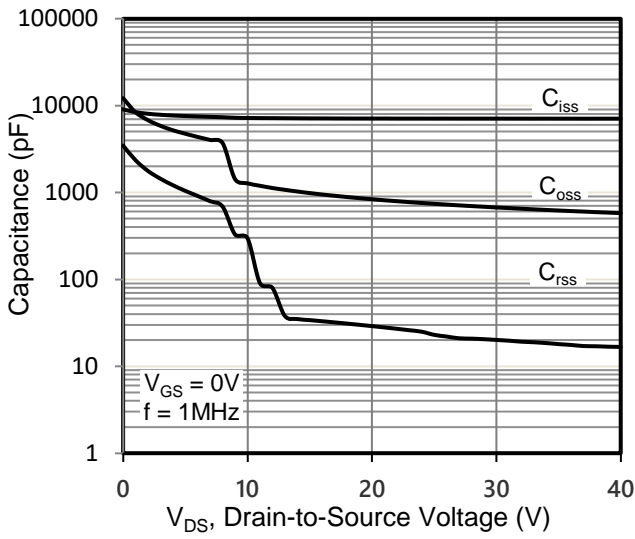Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.

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Electrical Characteristics $(T_J=25℃,$ Unless Otherwise Noted)

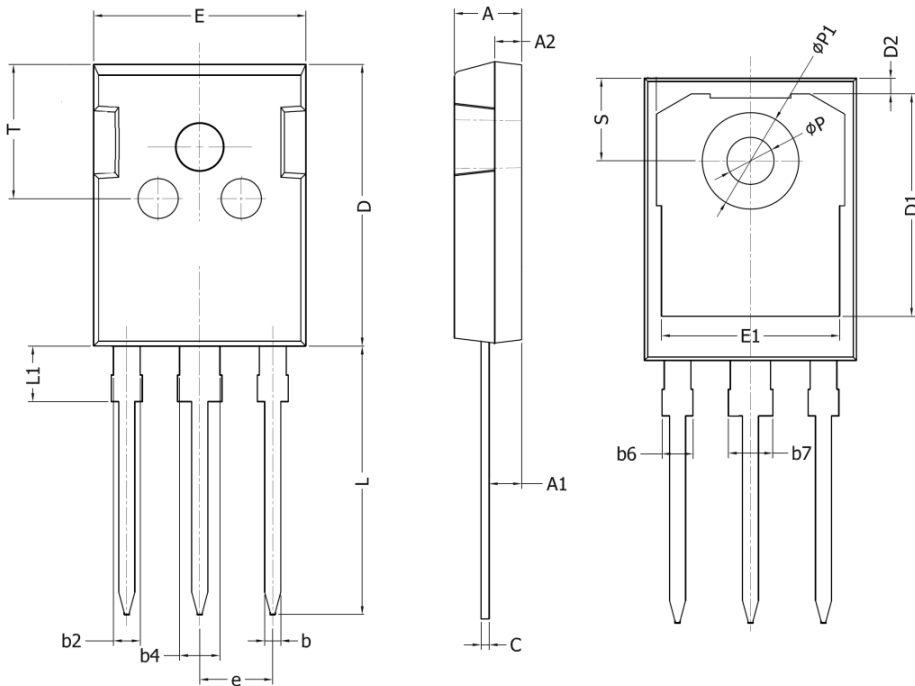| Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V,\ I_D=250uA$	500	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=500V,\ V_{GS}=0V$	---	---	1	uA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS},\ I_D=250uA$	2.5	---	4.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=±30V,\ V_{DS}=0V$	---	---	±10	uA
$R_{DS(ON)}$	Drain-Source On-state Resistance	$V_{GS}=10V,\ I_D=22.5A$	---	0.08	0.10	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=25V,$ Freq.=1MHz	---	7050	---	pF
C_{oss}	Output Capacitance		---	740	---	
C_{rss}	Reverse Transfer Capacitance		---	23	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=250V,$ $V_{GS}=10V,\ R_G=25Ω,$ $I_D=45A$	---	84	---	nS
T_r	Turn-on Rise Time		---	87	---	
$T_{d(off)}$	Turn-off Delay Time		---	500	---	
T_f	Turn-off Fall Time		---	170	---	
Q_g	Total Gate Charge	$V_{DD}=400V,$ $V_{GS}=10V,\ I_D=45A$	---	130	---	nC
Q_{gs}	Gate-Source Charge		---	33	---	
Q_{gd}	Gate-Drain Charge		---	43	---	
Source-Drain Characteristics $(T_J=25℃)$						
V_{SD}	Diode Forward Voltage2	$V_{GS}=0V,\ I_S=22.5A,T_J=25℃$	---	0.8	1.4	V
t_{rr}	Reverse Recovery Time	$I_F=45A,$ di/dt=100A/μs，$T_J=25℃$	---	470	---	nS
Q_{rr}	Reverse Recovery Charge		---	8	---	nC

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

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

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Typical Characteristics

Figure 1. Output Characteristics (T$_J$ = 25°C)

Figure 2. Body Diode Forward Voltage

Figure 3. Drain Current vs. Temperature

Figure 4. BV$_{DSS}$ Variation vs. Temperature

Figure 5. Transfer Characteristics

Figure 6. On-Resistance vs. Temperature

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Figure 7. Capacitance

Figure 8. Gate Charge

Figure 9. Transient Thermal Impedance

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TO-247 Package Outline Dimensions

Symbol	Dimensions In Millimeters	
	Min.	**Max.**
A	4.90	5.20
A1	2.31	2.51
A2	1.9	2.1
b	1.16	1.26
b2	1.96	2.06
b4	2.96	3.06
b6	-	2.25
b7	-	3.25
C	0.59	0.66
D	20.90	21.20
D1	16.25	16.85
D2	1.05	1.35
E	15.75	16.10
E1	13.00	13.60
e	5.436 BSC	
L	19.80	20.20
L1	-	4.30
P	3.40	3.60
P1	7.00	7.40
S	6.05	6.25
T	9.80	10.20