N-Channel Enhancement Mode MOSFET
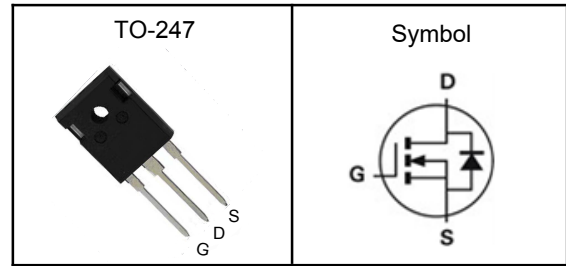
Features

● Fast switching speed

● Reliable and Rugged

● ROHS Compliant & Halogen-Free

Applications

● Power Management in Desktop Computer

● DC/DC Converters

Pin Description

TO-247	Symbol

V_{DSS}	200	V
$R_{DS(ON)-Typ}$	9.1	mΩ
I_D	130	A

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

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		200	V
V_{GSS}	Gate-Source Voltage		±20	V
T_J	Maximum Junction Temperature		-55 to 175	℃
T_{STG}	Storage Temperature Range		-55 to 175	℃
E_{AS}	Single Pulse Avalanche Energy		960	mJ
I_{DM}[①]	Pulse Drain Current Tested		520	A
I_D	Continuous Drain Current	T_C=25°C	130	A
	Continuous Drain Current	T_C=100°C	92	A
P_D	Maximum Power Dissipation	T_C=25°C	507	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$[③]	Thermal Resistance-Junction to Ambient	62	℃/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.3	℃/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	200	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=200V, V_{GS}=0V	---	---	10	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	3.0	---	5.0	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	---	---	±100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	V_{GS}=10V, I_D=35A	---	9.1	9.8	mΩ
Dynamic Characteristics[5]					
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=50V, Freq.=1.0MHz	---	11972	---	pF
C_{oss}	Output Capacitance		---	860	---	pF
C_{rss}	Reverse Transfer Capacitance		---	380	---	pF
$T_{d(on)}$	Turn-on Delay Time	V_{GS}=10V,V_{DD}=130V, I_D=81A,R_G=2.7Ω	---	40	---	nS
T_r	Turn-on Rise Time		---	105	---	nS
$T_{d(off)}$	Turn-off Delay Time		---	65	---	nS
T_f	Turn-off Fall Time		---	75	---	nS
Q_g	Total Gate Charge	V_{GS}=10V,V_{DD}=100V, I_D=81A	---	201	---	nC
Q_{gs}	Gate-Source Charge		---	76	---	nC
Q_{gd}	Gate-Drain Charge		---	70	---	nC
Rg	Gate resistance	f=1 MHz, open drain	---	0.8	---	Ω
Source-Drain Characteristics					
I_S	Continuous Source Current		--	---	130	A
ISM	Maximum Pulsed Drain-Source Diode Forward Current		--	---	520	A
V_{SD}	Diode Forward Voltage	I_S=81A, V_{GS}=0V	---	---	1.4	V
t_{rr}	Reverse recovery time	Is=30A,V_{GS}=0V diF/dt=100A/μs	---	153	---	ns
Q_{rr}	Reverse recovery charge		---	1.06	---	nC
Irrm	Peak Reverse Recovery Current		---	13.5	---	A

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

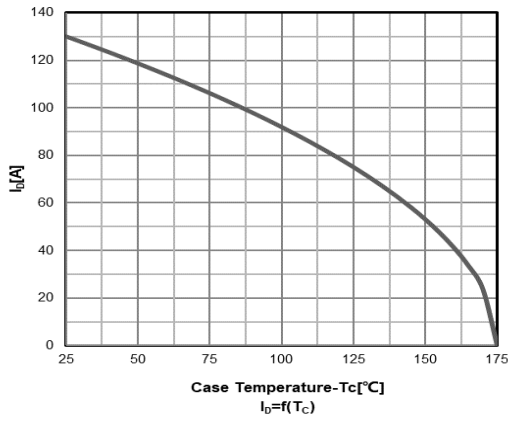Note ⑤ : Guaranteed by design, not subject to production testing.

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Typical Characteristics

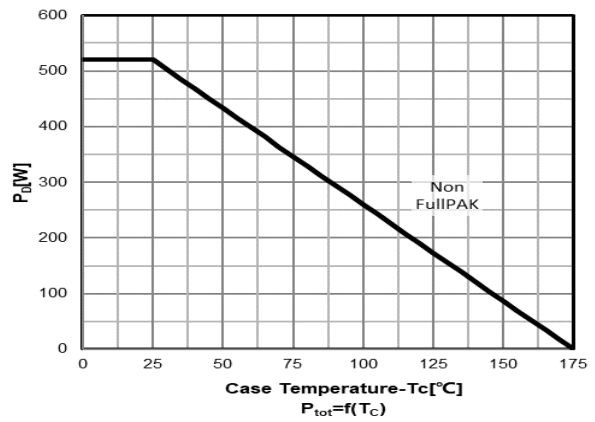Figure 1: Continuous Drain Current vs Temperature
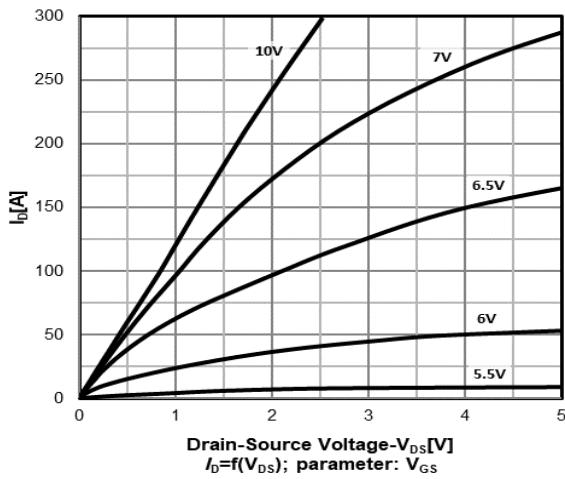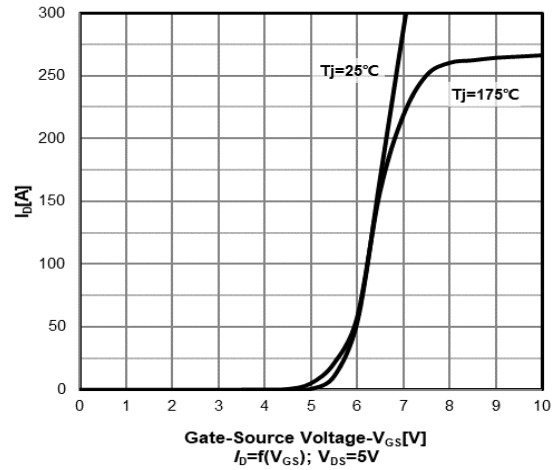
Figure 2: Power Dissipation

Figure 3: Typ. output characteristics
Parameter: Vgs
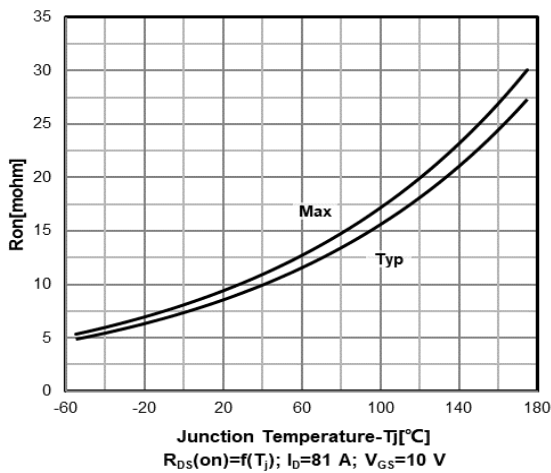
Figure 4: Typ. transfer characteristics
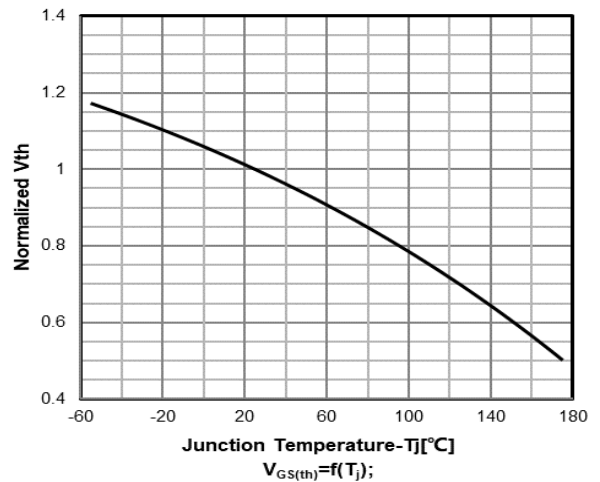
Figure 5: On-Resistance vs Junction Temperature

Figure 6: Vth vs Junction Temperature
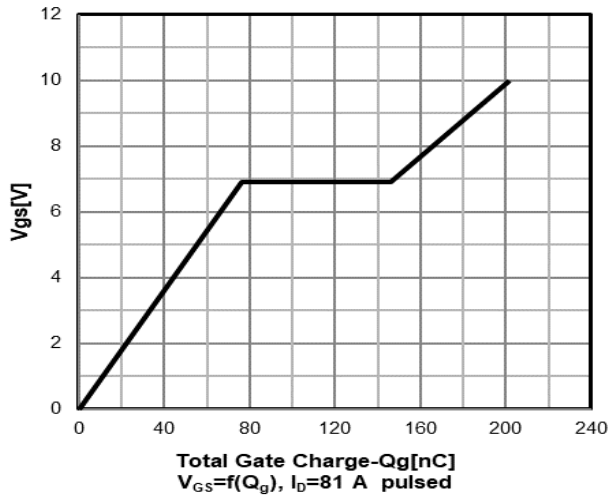
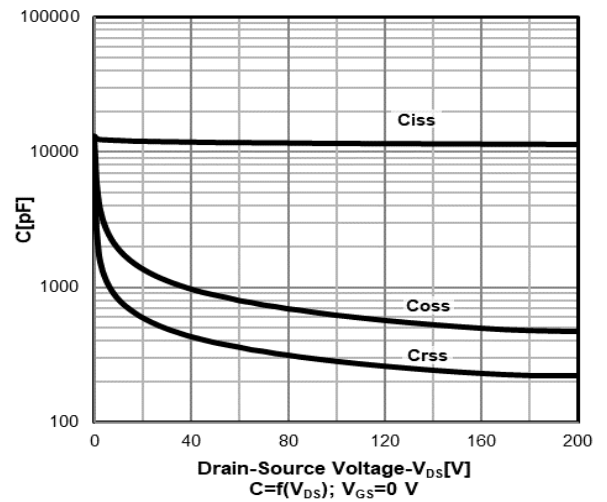# N-Channel Enhancement Mode MOSFET

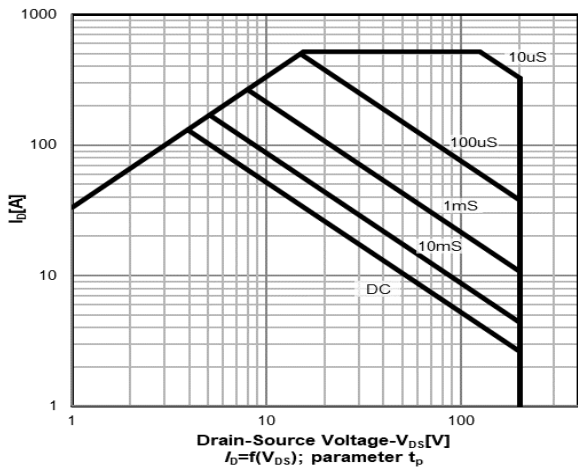Figure 7: Gate-Charge Characteristics

Figure 8: Capacitance Characteristics

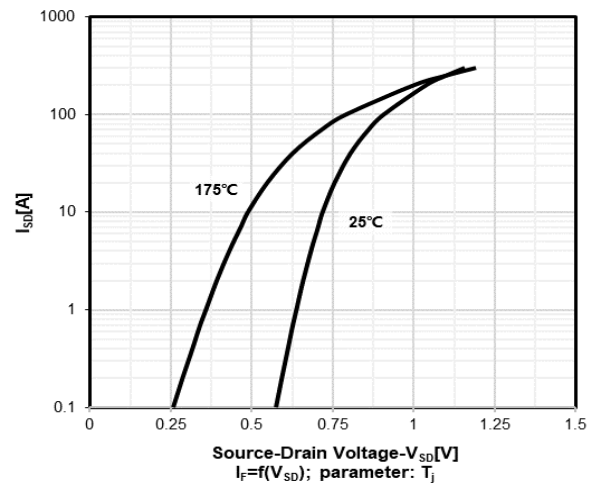Figure 9: Maximum Forward Biased Safe Operating Area
Parameter:Tp

Figure 10: Body-Diode Characteristics

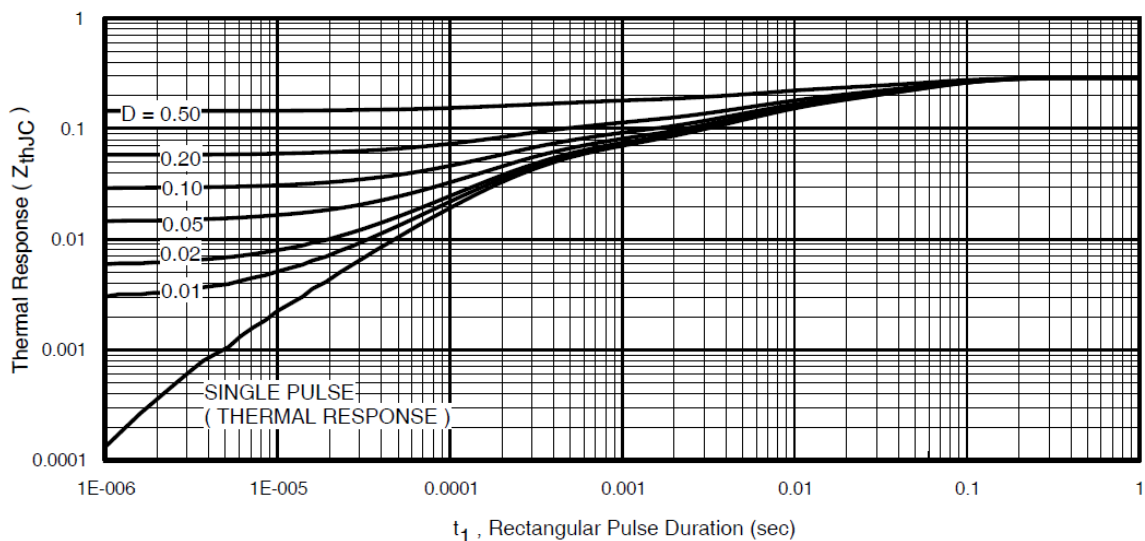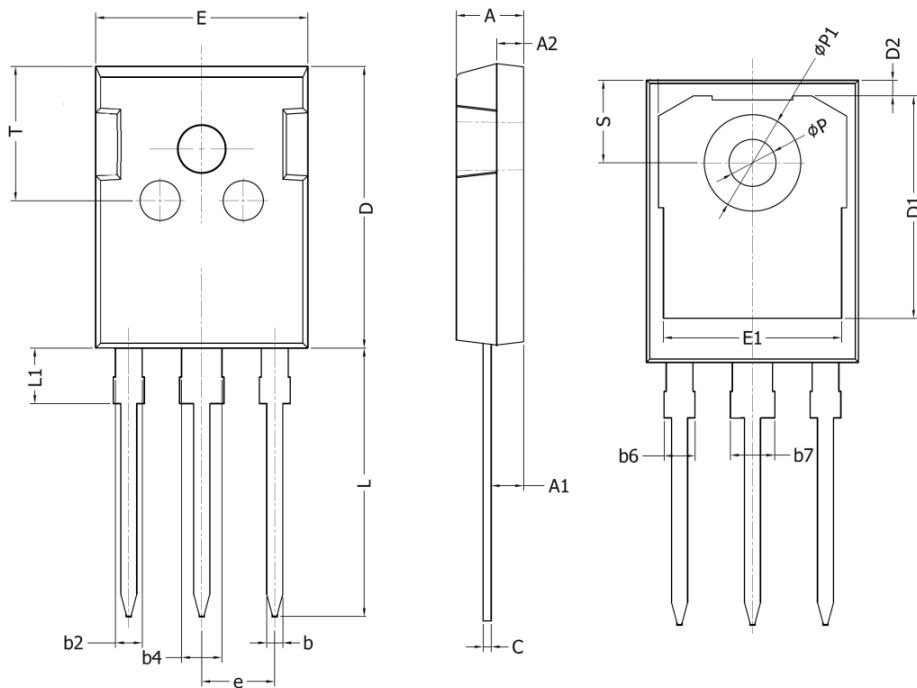Figure 11: Maximum Transient Thermal Impedance

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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