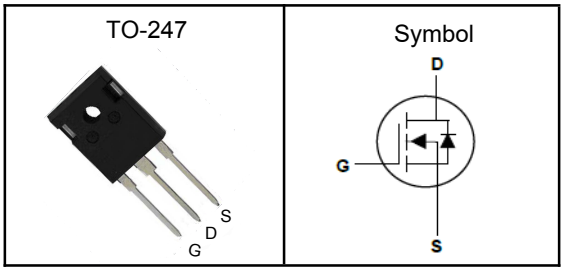
N-Channel Enhancement Mode MOSFET

Features

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

Pin Description



Applications

- Power Management in Desktop Computer
- DC/DC Converters

V_{DSS}	250	V
$R_{DS(ON)-Typ}$	65	mΩ
I_D	40	A

Absolute Maximum Ratings(T_J=25℃, Unless Otherwise Noted)

Symbol	Parameter		N-Channel	Unit
V_{DSS}	Drain-Source Voltage		250	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		2000	mJ
I_{DM}①	Pulse Drain Current Tested		160	A
I_D	Continuous Drain Current	T_C=25°C	40	A
P_D	Maximum Power Dissipation	T_C=25°C	310	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient① (Max)	62.5	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case①	0.36	℃/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.

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	250	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=250V, V_{GS}=0V	---	---	1	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	2	---	4	V
I_{GSS}	Gate Leakage Current	V_{GS}=±30V, V_{DS}=0V	---	---	±100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	V_{GS}=10V , I_D=20A	---	65	90	mΩ
Dynamic Characteristics⑤						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=25V, Freq.=1MHz	---	3700	---	pF
C_{oss}	Output Capacitance		---	360	---	
C_{rss}	Reverse Transfer Capacitance		---	2.5	---	
$T_{d(on)}$	Turn-on Delay Time	V_{DD}=125V, R_G=15Ω, I_D=40A	---	80	---	nS
T_r	Turn-on Rise Time		---	620	---	
$T_{d(off)}$	Turn-off Delay Time		---	140	---	
T_f	Turn-off Fall Time		---	181	---	
Q_g	Total Gate Charge	V_{DD}=200V , V_{GS}=10V , I_D=40A	---	60	---	nC
Q_{gs}	Gate-Source Charge		---	14	---	
Q_{gd}	Gate-Drain Charge		---	11	---	
Source-Drain Characteristics （T_J=25℃）						
V_{SD}	Diode Forward Voltage②	V_{GS}=0V , I_S=20A ,T_J=25℃	---	---	1.4	V
t_{rr}	Reverse Recovery Time	V_{GS}=0V, I_S=20A, di/dt=100A/μs，T_J=25℃	---	230	---	nS
Q_{rr}	Reverse Recovery Charge		---	2.1	---	uC

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

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

Typical Characteristics

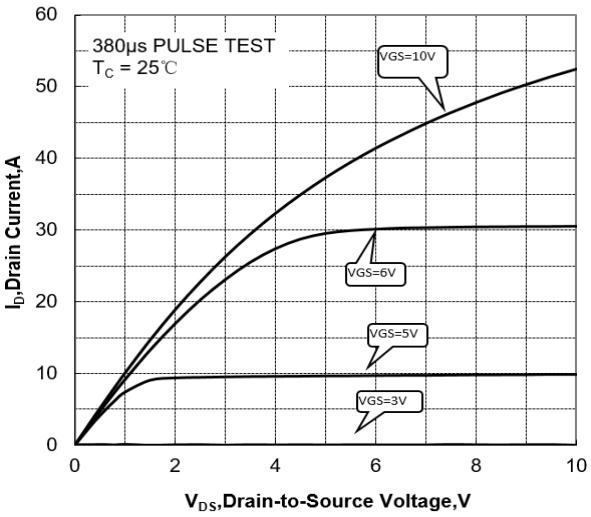


Figure 1 Typical Output Characteristics

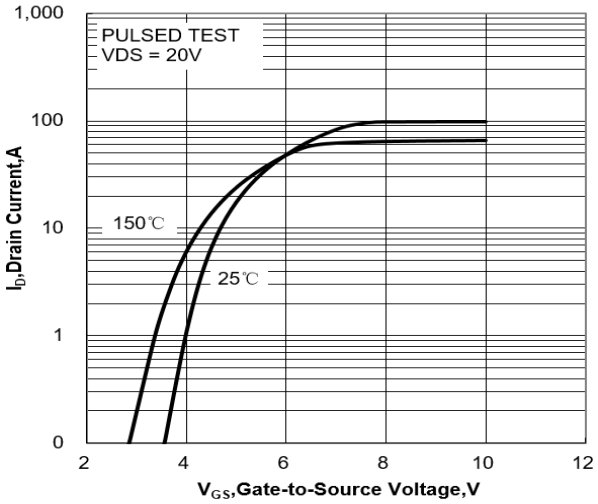


Figure 2 Typical Transfer Characteristics

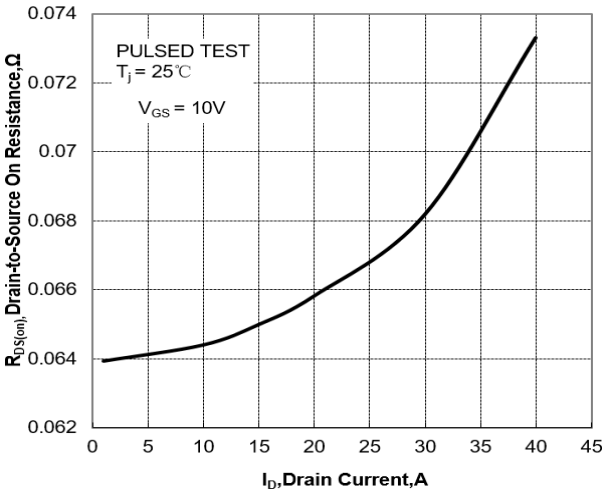


Figure 3 Typical Drain to Source ON Resistance vs Drain Current

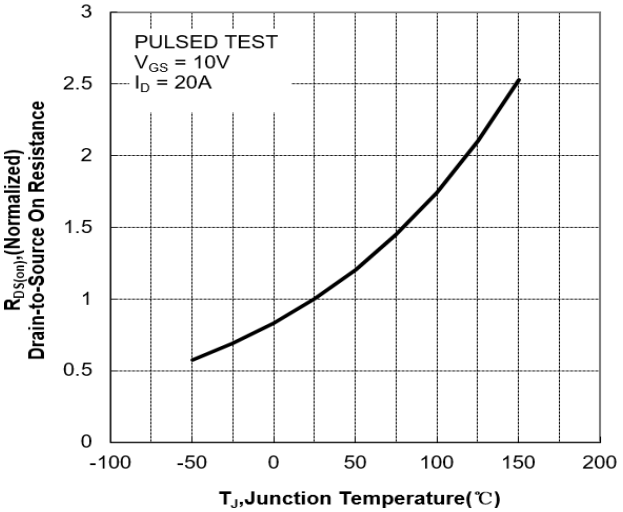


Figure 4 Typical Drian to Source on Resistance vs Junction Temperature

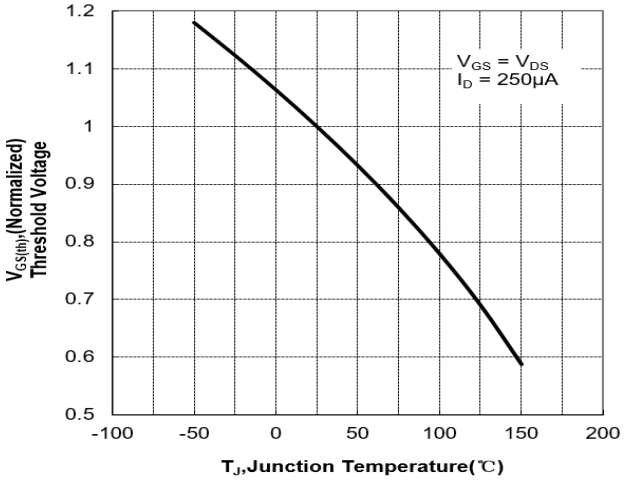


Figure 5 Typical Theshold Voltage vs Junction Temperature

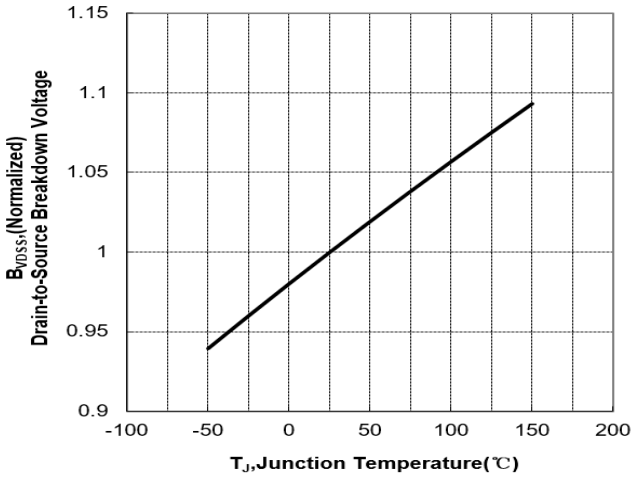


Figure 6 Typical Breakdown Voltage vs Junction Temperature

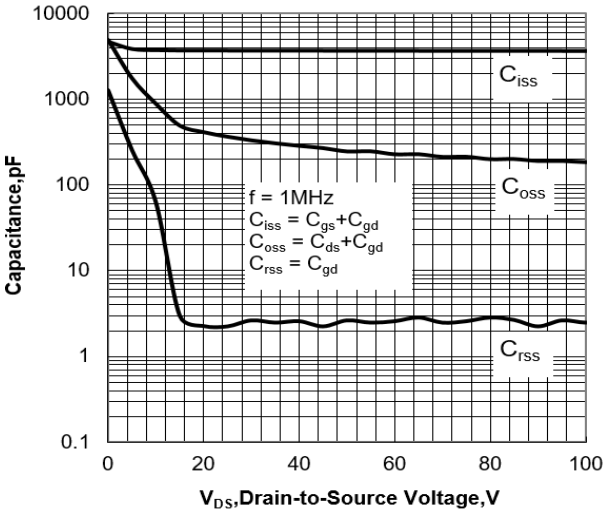


Figure 7 Typical Capacitance vs Drain to Source Voltage

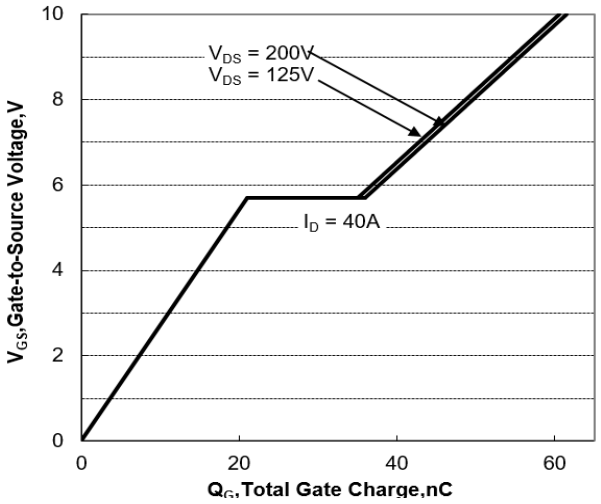


Figure 8 Typical Gate Charge vs Gate to Source Voltage

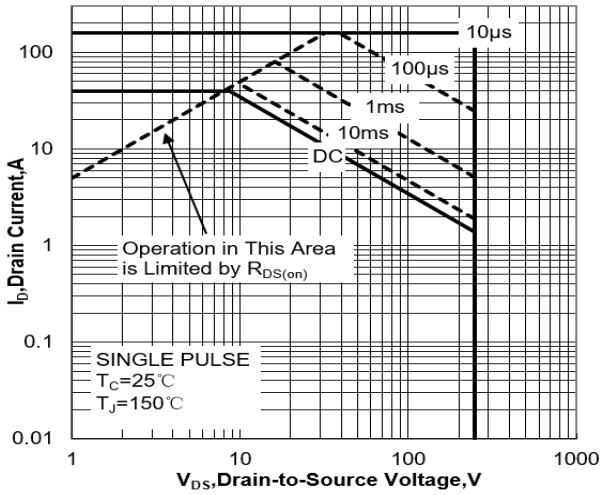


Figure 9 Safe Operating Area

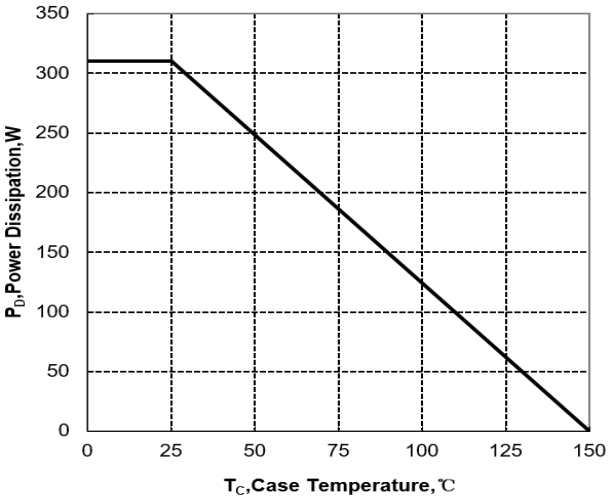


Figure 10 Power Dissipation

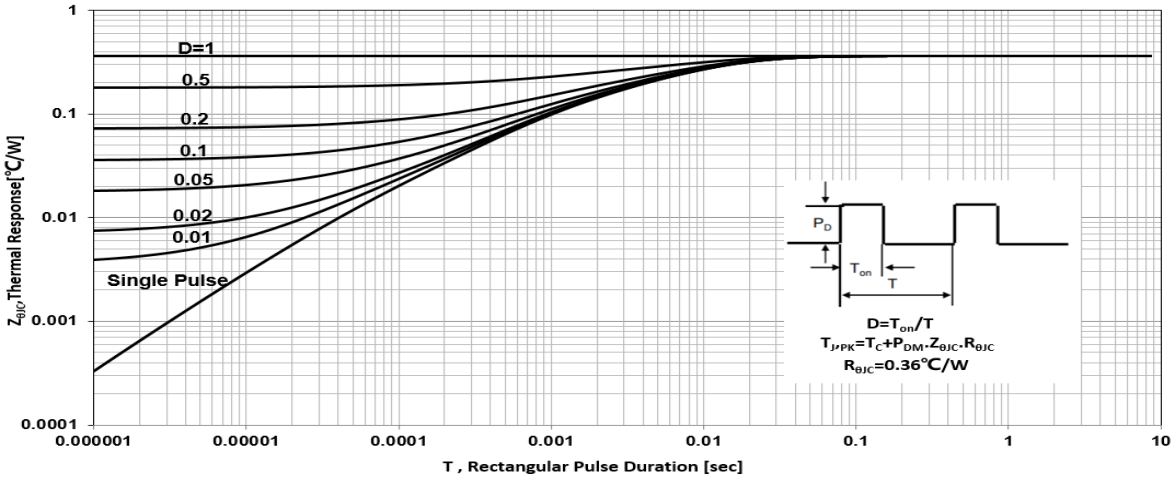


Figure 11 Max Thermal Impendance

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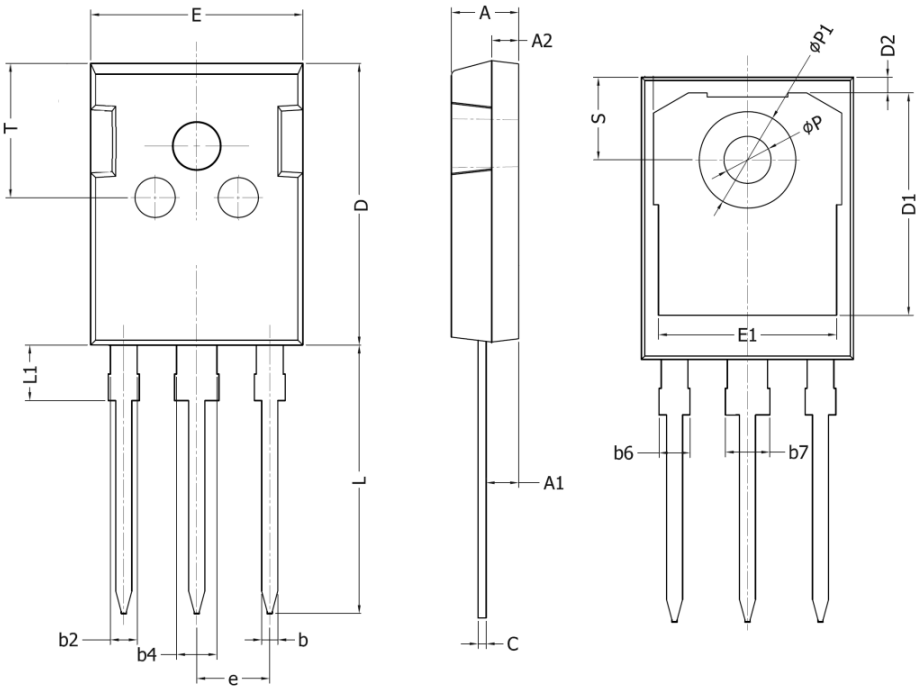
TO-247 Package Outline Dimensions



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