

N-Channel Enhancement Mode MOSFET

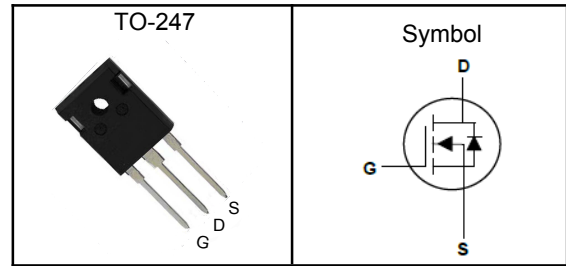
Features

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

Applications

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- AC to DC Converters

Pin Description



V_{DSS}	500	V
$R_{DS(ON)-Typ}$	0.21	Ω
I_D	25	A

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

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	500	V
V_{GSS}	Gate-Source Voltage	± 30	V
T_J	Maximum Junction Temperature	-55 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
E_{AS}	Single Pulse Avalanche Energy ^③	2000	mJ
$I_{DM}^{①}$	Pulse Drain Current Tested	100	A
I_D	Continuous Drain Current	$T_c=25^\circ\text{C}$	A
P_D	Maximum Power Dissipation	$T_c=25^\circ\text{C}$	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ^①	100	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ^①	1.47	$^\circ\text{C}/\text{W}$

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

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150°C .

Note ③ : Surface Mounted on 1in^2 FR-4 board with 1oz.



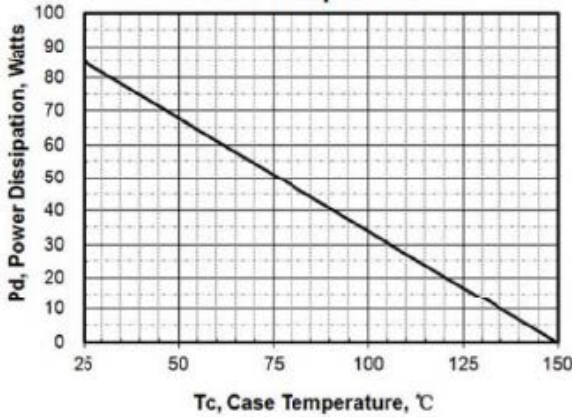
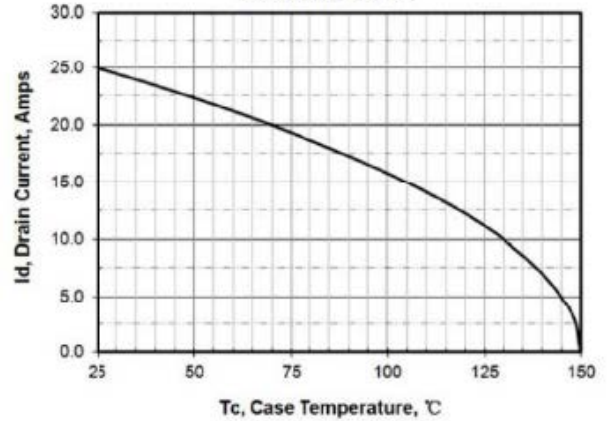
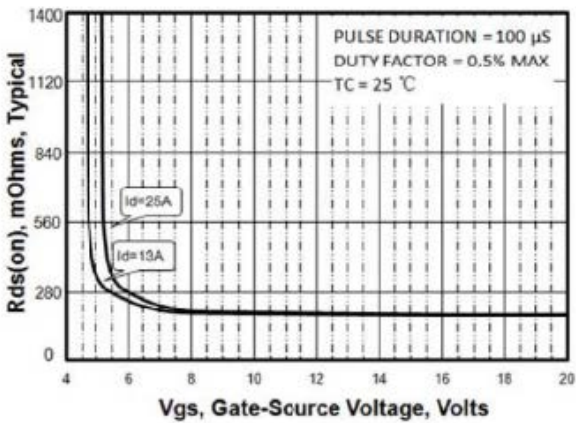
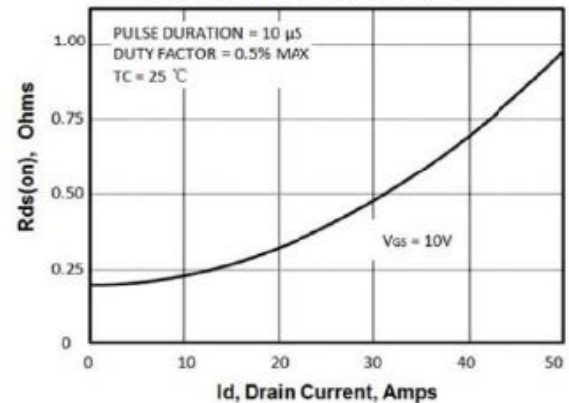
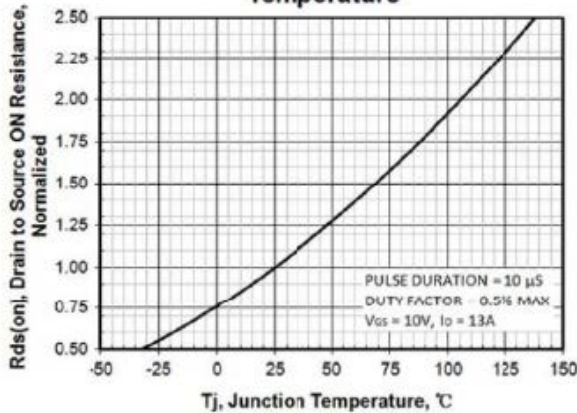
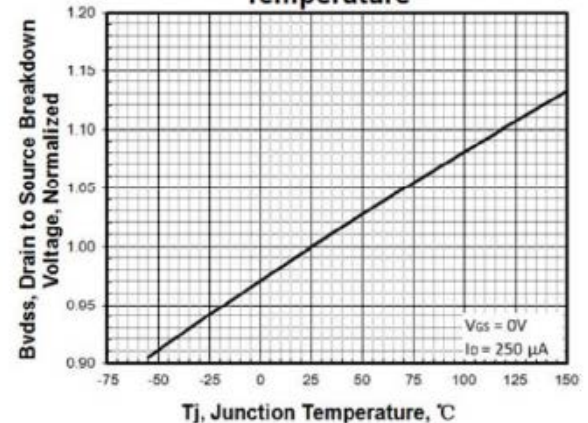
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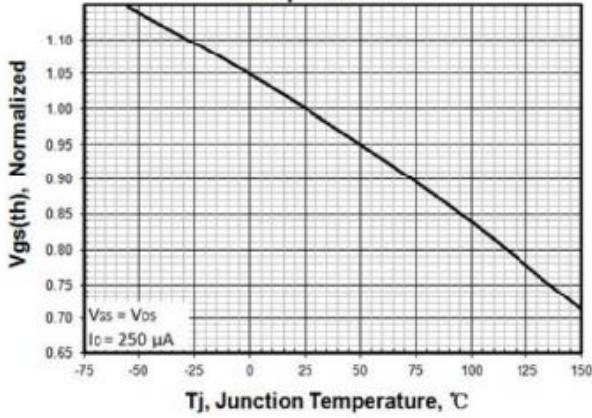
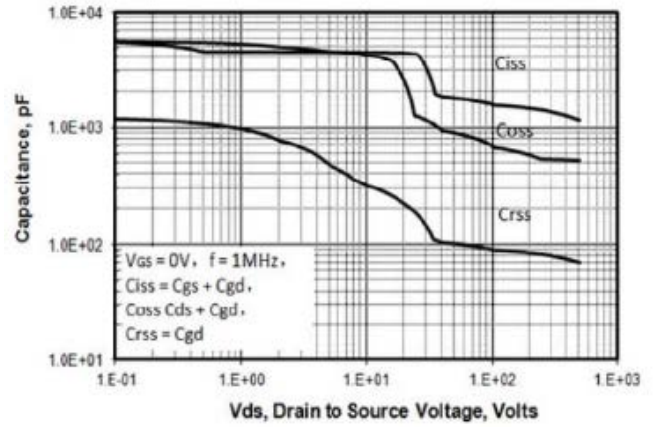
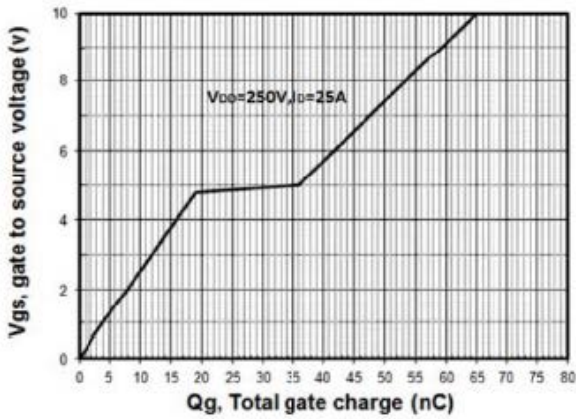
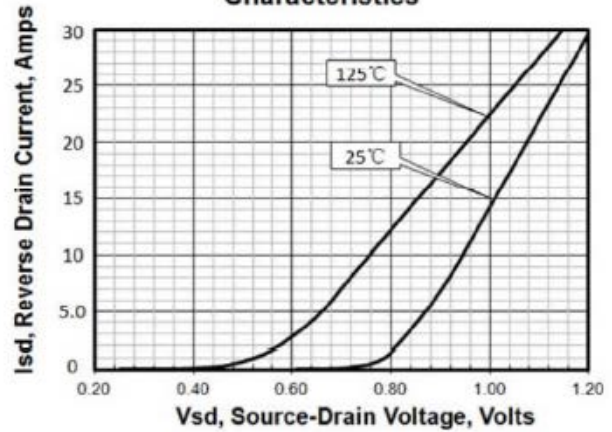
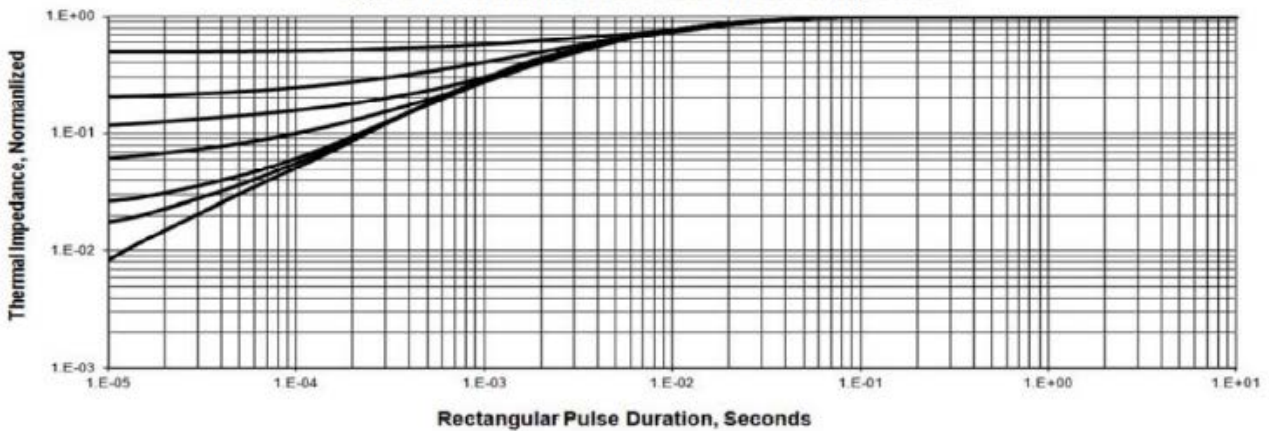
Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

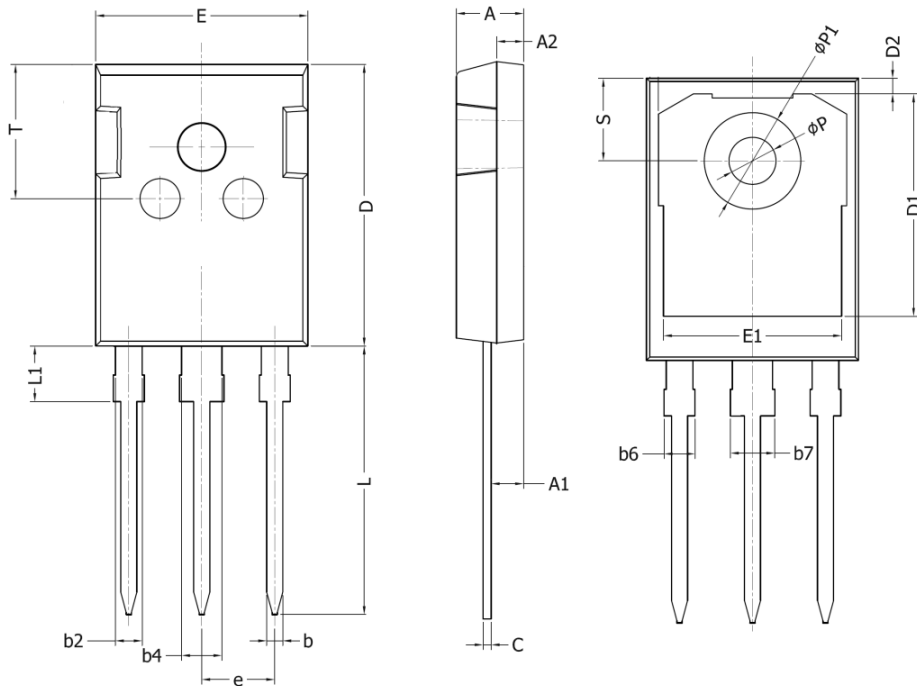
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	500	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=500V, V_{GS}=0V$	---	---	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	---	4.0	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=12.5A$	---	0.21	0.28	Ω
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=25V, \text{Freq.}=1\text{MHz}$	---	3520	---	pF
C_{oss}	Output Capacitance		---	300	---	
C_{rss}	Reverse Transfer Capacitance		---	280	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=250V, R_G=25\Omega, I_D=13A$	---	45	---	nS
T_r	Turn-on Rise Time		---	90	---	
$T_{d(off)}$	Turn-off Delay Time		---	120	---	
T_f	Turn-off Fall Time		---	80	---	
Q_g	Total Gate Charge	$V_{DD}=400V, V_{GS}=10V, I_D=25A$	---	66	---	nC
Q_{gs}	Gate-Source Charge		---	19	---	
Q_{gd}	Gate-Drain Charge		---	17	---	
Source-Drain Characteristics ($T_J=25^{\circ}\text{C}$)						
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=25A, T_J=25^{\circ}\text{C}$	---	---	1.5	V
t_{rr}	Reverse Recovery Time	$I_S=25A, V_R=250V, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	565	---	nS
Q_{rr}	Reverse Recovery Charge		---	4.2	---	nC

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

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

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Typical Characteristics
Figure 1 . Max. Power Dissipation vs Case Temperature

Figure 2 . Maximum Continuous Drain Current vs Tc

Figure 3 . Rds(on) vs Gate Voltage

Figure 4 . Drain to Source ON Resistance vs Drain Current

Figure 5 . Rds(on) vs Junction Temperature

Figure 6 . Breakdown Voltage vs Temperature


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Figure 7 . Threshold Voltage vs Temperature

Figure 8 . Capacitance vs Vds

Figure 9 . Typical Gate Charge

Figure 10. Body Diode Transfer 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