

N-Channel Enhancement Mode MOSFET

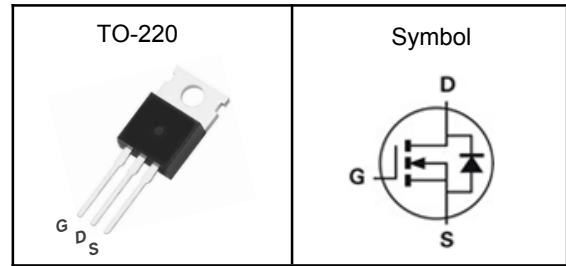
Features

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

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



V_{DSS}	40	V
$R_{DS(ON)-Typ}$	1.5	$m\Omega$
I_D	150	A

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

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	40	V
V_{GSS}	Gate-Source Voltage	± 20	V
T_J	Maximum Junction Temperature	-55 to 150	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
EAS	Single Pulse Avalanche Energy ^③	1052	mJ
$I_{DM}^{①}$	Pulse Drain Current Tested	800	A
I_D	Continuous Drain Current	$T_C=25^\circ C$	150
P_D	Maximum Power Dissipation	$T_C=25^\circ C$	147

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	43	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ^①	0.85	$^\circ C/W$

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

Note ② : UIS tested and pulse width are limited by maximum junction temperature $150^\circ C$.

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



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Electrical Characteristics (T_J=25°C, Unless Otherwise Noted)

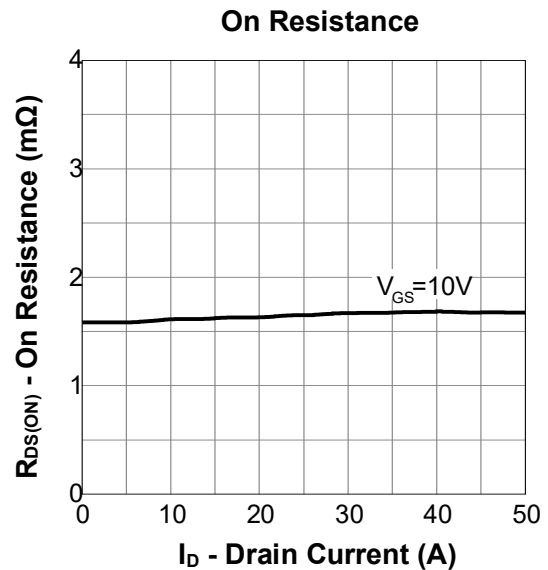
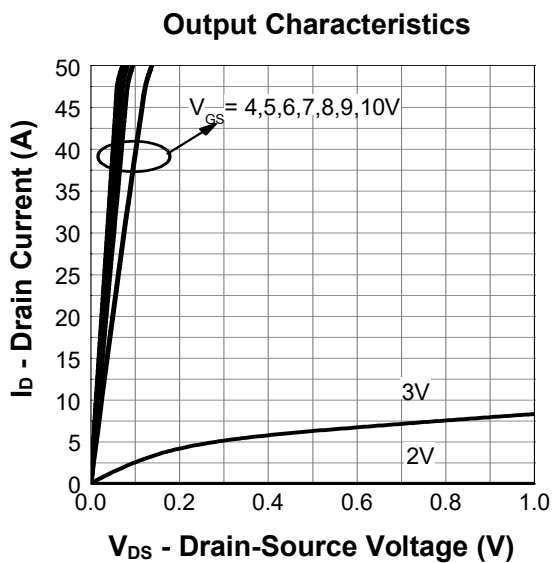
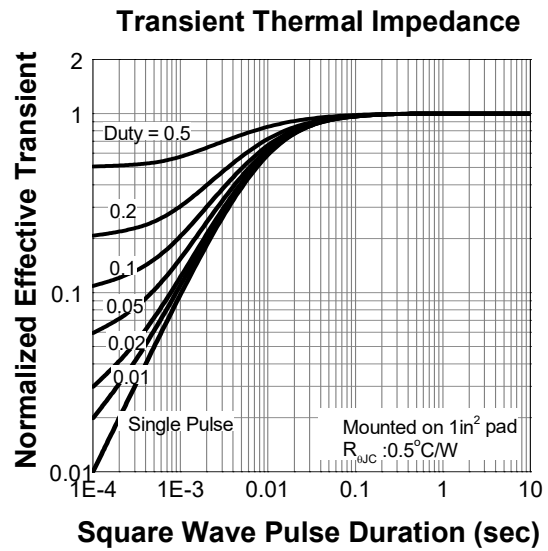
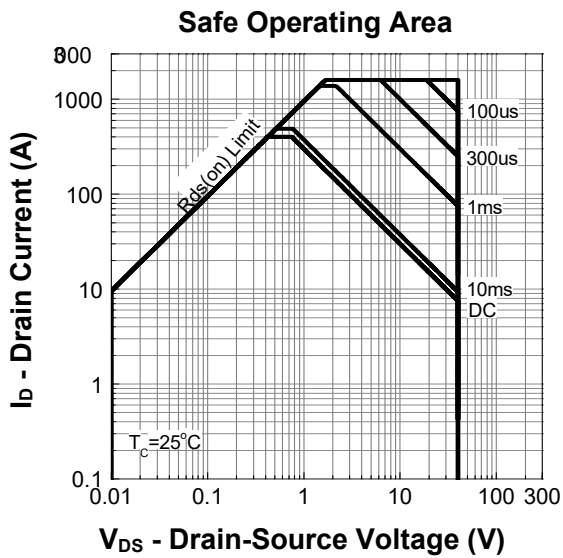
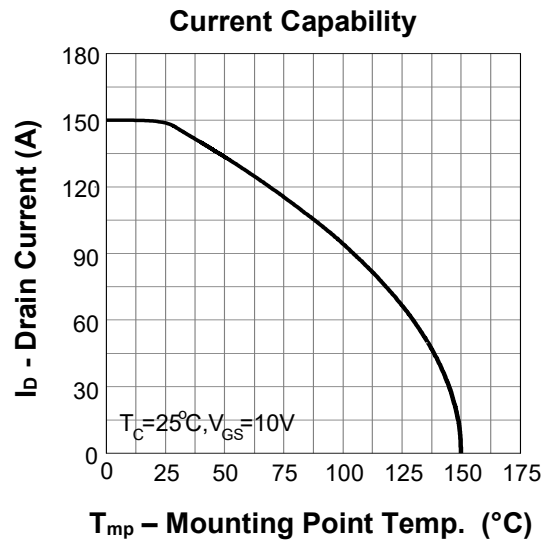
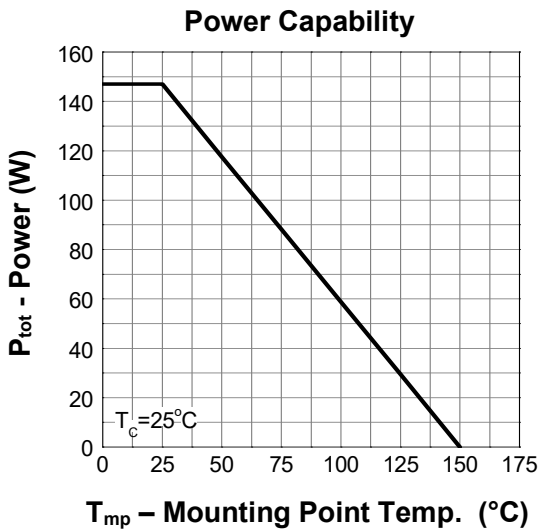
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
B _{VDS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	40	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =32V, V _{GS} =0V	---	---	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2.0	---	4.0	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 =20A	---	1.5	1.9	mΩ
Dynamic Characteristics^⑤						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, Freq.=1MHz	---	4925	---	pF
C _{oss}	Output Capacitance		---	1655	---	
C _{rss}	Reverse Transfer Capacitance		---	122	---	
T _{d(on)}	Turn-on Delay Time	V _{DD} =20V, I _D =20A, V _{GS} =10V , R _G =4.5Ω, R _L =1Ω	---	16	---	nS
T _r	Turn-on Rise Time		---	48	---	
T _{d(off)}	Turn-off Delay Time		---	75	---	
T _f	Turn-off Fall Time		---	42	---	
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =20A	---	---	---	S
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =10V, I _D =20A	---	80	---	nC
Q _{gs}	Gate-Source Charge		---	18	---	
Q _{gd}	Gate-Drain Charge		---	15	---	
Source-Drain Characteristics						
V _{SD} ^④	Diode Forward Voltage	I _S =20A, V _{GS} =0V	---	---	1.3	V
t _{rr}	Reverse Recovery Time	I _F =20A	---	68	---	nS
Q _{rr}	Reverse Recovery Charge	di/dt=100A/μs, T _J =25°C	---	92	---	nC

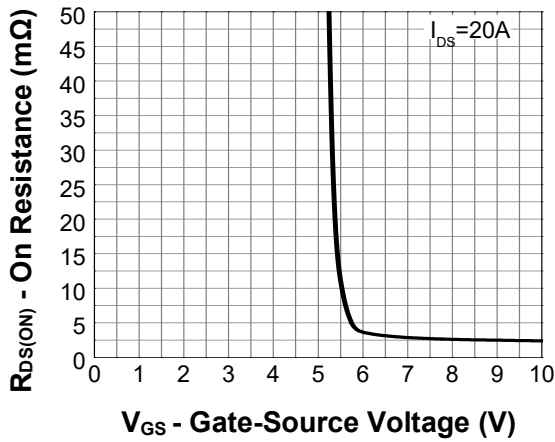
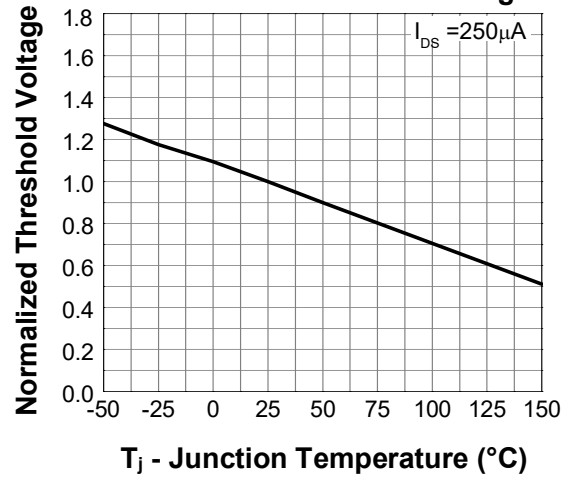
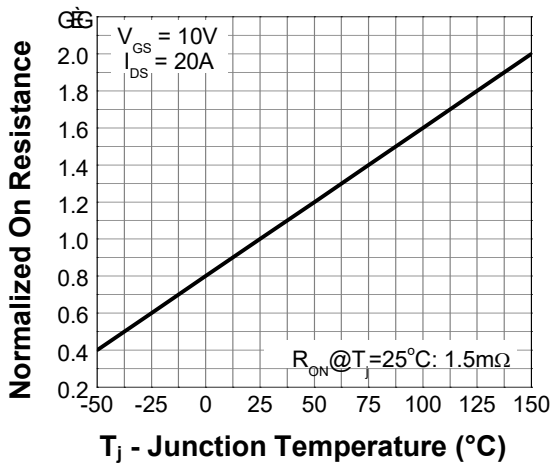
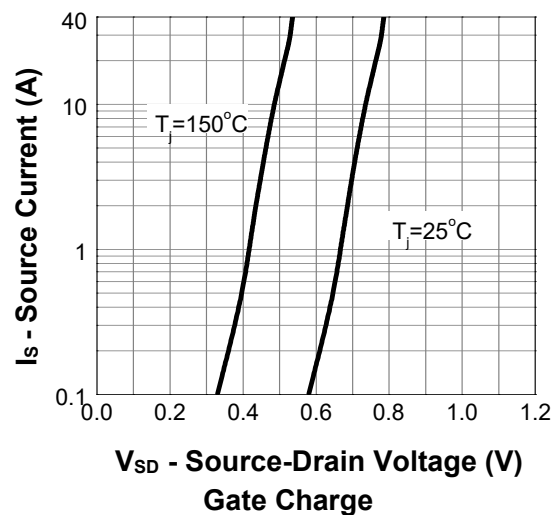
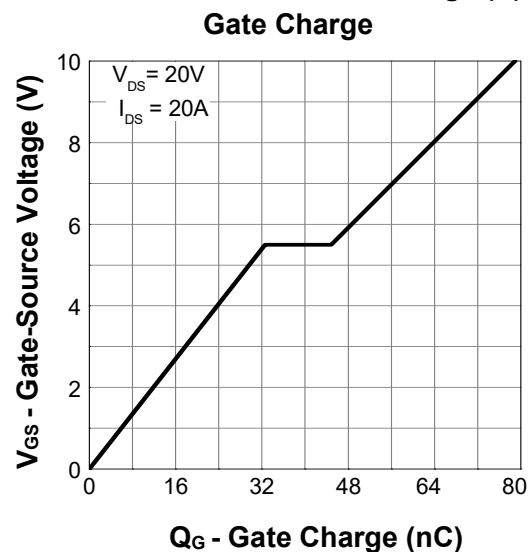
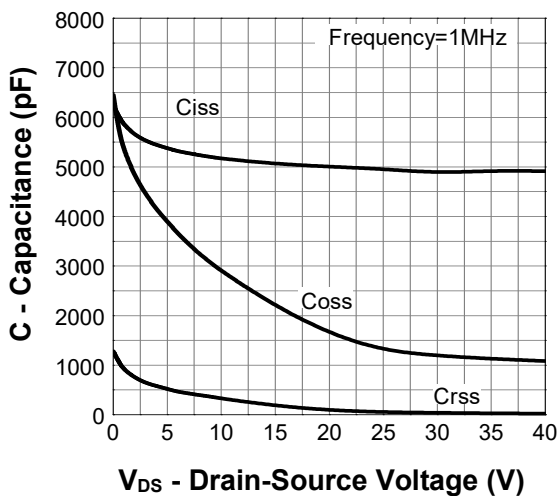
Note ④ : Pulse test (pulse width≤300us, duty cycle≤2%).

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

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Typical Characteristics



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Transfer Characteristics

Normalized Threshold Voltage

Normalized R_{ON} Resistance

Diode Forward Current

Capacitance


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TO-220 Package Outline Data


Symbol	Dimensions In Millimeters	
	Min.	Max.
A	4.350	4.650
A1	2.250	2.550
b	0.710	0.910
b1	1.170	1.400
c	0.330	0.650
c1	1.200	1.400
D	9.910	10.250
E	8.9500	9.750
E1	12.650	12.950
e	2.540 TYP.	
e1	4.980	5.180
F	2.650	2.950
H	7.900	8.100
h	0.000	0.300
L	12.700	13.500
L1	2.850	3.250
V	7.500 REF.	
Φ	3.400	3.800