

N-Channel Enhancement Mode MOSFET

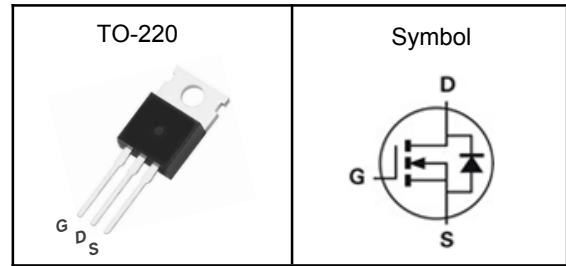
Features

- High Speed Power Switching
- Reliable and Rugged
- ROHS Compliant
- 100% Avalanche Tested

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



V_{DSS}	120	V
$R_{DS(ON)-Typ}$	5.5	m Ω
I_D	110	A

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

Symbol	Parameter	Rating	Unit	
V_{DSS}	Drain-Source Voltage	120	V	
V_{GSS}	Gate-Source Voltage	± 20	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	480	mJ	
$I_{DM}^{①}$	Pulse Drain Current Tested	440	A	
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$	110	A
	Continuous Drain Current	$T_C=100^\circ\text{C}$	75	A
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	167	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	62	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ₁	0.75	$^\circ\text{C}/\text{W}$

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

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

Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.



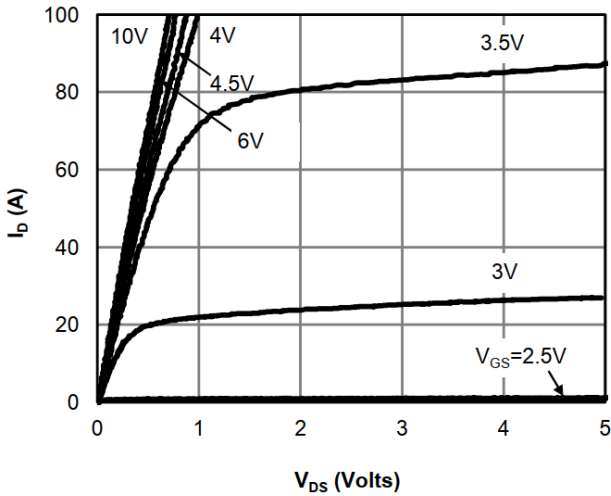
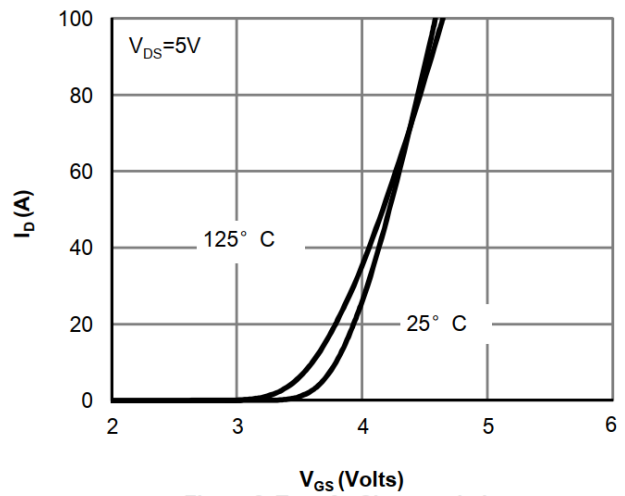
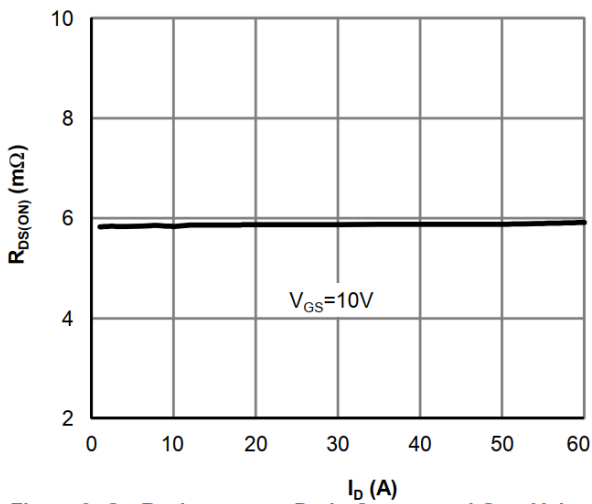
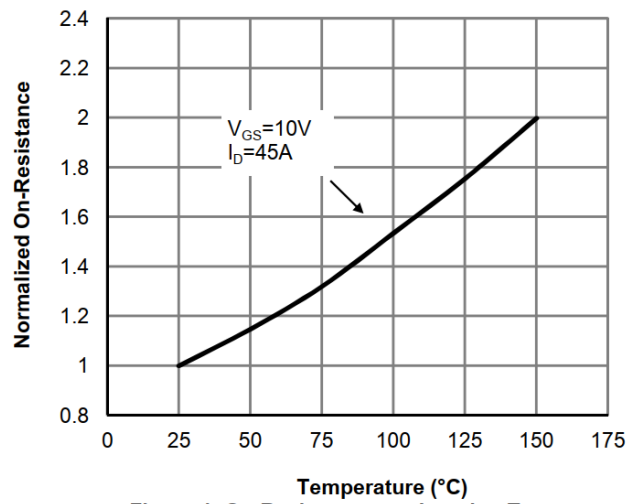
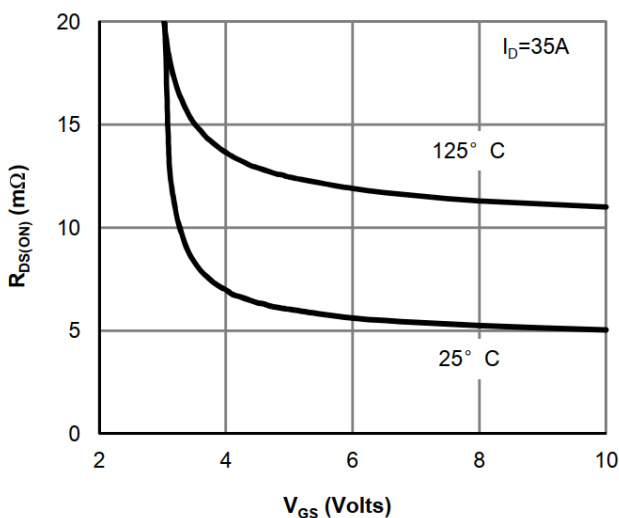
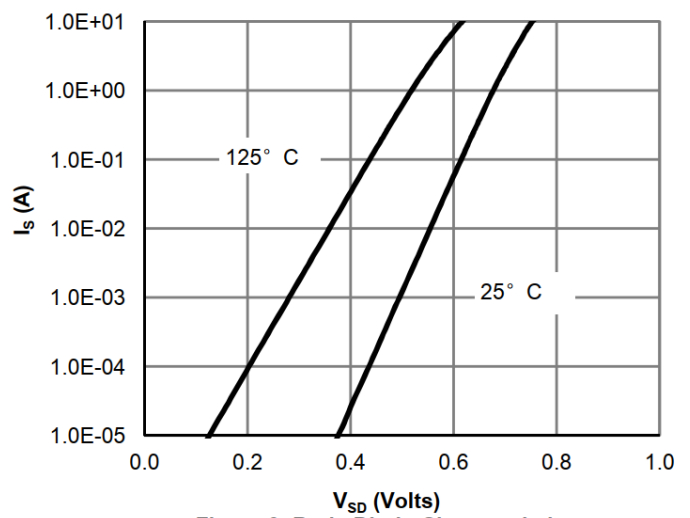
N-Channel Enhancement Mode MOSFET

Electrical Characteristics (T_J=25°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 =250uA	120	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =120V, 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} =±20V, V _{DS} =0V	---	---	±100	nA
R _{DS(ON)}	Drain-Source On-state Resistance	V _{GS} =10V, I _D =45A	---	5.5	7.2	mΩ
Dynamic Characteristics ^⑤						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =60V, Freq.=1MHz	---	2950	---	pF
C _{oss}	Output Capacitance		---	845	---	
C _{rss}	Reverse Transfer Capacitance		---	9.9	---	
T _{d(on)}	Turn-on Delay Time	V _{DS} =60V, V _{GS} =10V, R _G =3Ω, I _D =55A	---	23	---	nS
T _r	Turn-on Rise Time		---	6.7	---	
T _{d(off)}	Turn-off Delay Time		---	28	---	
T _f	Turn-off Fall Time		---	7.1	---	
Q _g	Total Gate Charge	V _{DS} =60V, V _{GS} =10V, I _D =55A	---	36	---	nC
Q _{gs}	Gate-Source Charge		---	15	---	
Q _{gd}	Gate-Drain Charge		---	6	---	
Source-Drain Characteristics (T _J =25°C)						
V _{SD} ^④	Diode Forward Voltage	I _S =90A, V _{GS} =0V	---	---	1.2	V
t _{rr}	Reverse Recovery Time	I _F =35A di/dt=100A/μs, T _J =25°C	---	78	---	nS
Q _{rr}	Reverse Recovery Charge		---	33	---	nC

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

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

N-Channel Enhancement Mode MOSFET
Typical Characteristics

Figure 1: On-Region Characteristics

Figure 2: Transfer Characteristics

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

Figure 4: On-Resistance vs. Junction Temperature

Figure 5: On-Resistance vs. Gate-Source Voltage

Figure 6: Body-Diode Characteristics

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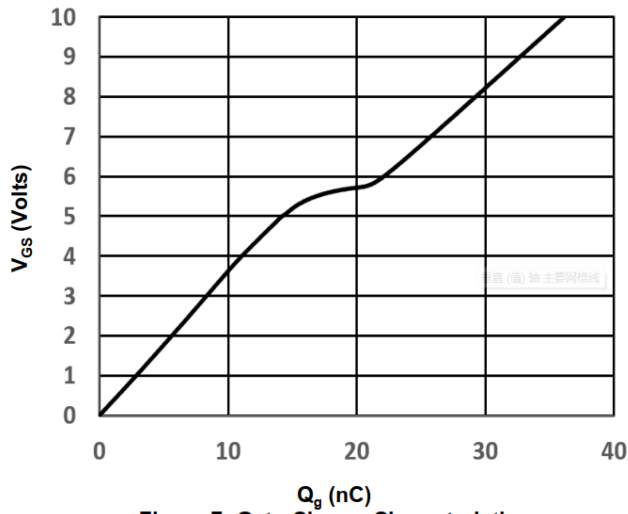


Figure 7: Gate-Charge Characteristics

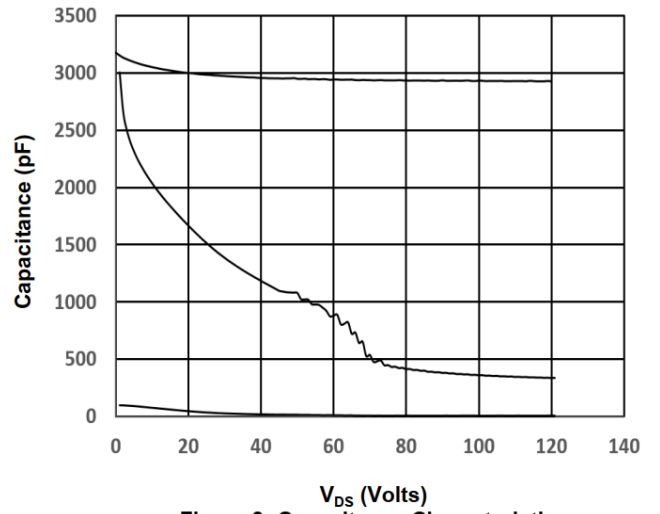


Figure 8: Capacitance Characteristics

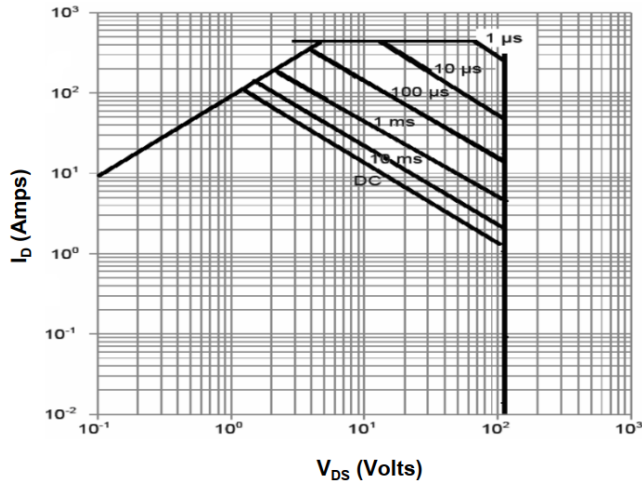


Figure 9: Maximum Forward Biased Safe Operating Area

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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