

N-Channel Enhancement Mode MOSFET

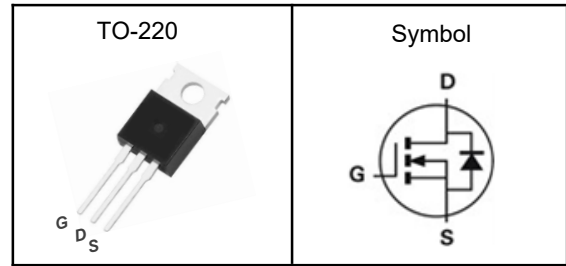
Features

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant & Halogen-Free

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



V_{DSS}	200	V
$R_{DS(ON)-Typ}$	9.5	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	200	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	2000	mJ
$I_{DM}^{①}$	Pulse Drain Current Tested	440	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$	A
	Continuous Drain Current	$T_C=100^\circ\text{C}$	A
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	62	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.45	$^\circ\text{C/W}$

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

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150°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	$V_{GS}=0V, I_D=250\mu A$	200	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=200V, V_{GS}=0V$	---	---	1	μA
		$V_{DS}=160V, V_{GS}=0V, T_J=125^{\circ}\text{C}$	---	---	100	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	---	4.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=35A$	---	9.5	11	m Ω
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=100V, \text{Freq.}=1.0\text{MHz}$	---	10656	---	pF
C_{oss}	Output Capacitance		---	389	---	
C_{riss}	Reverse Transfer Capacitance		---	16	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{GS}=10V, V_{DD}=100V, I_D=55A, R_G=4.7\Omega$	---	46	---	nS
T_r	Turn-on Rise Time		---	21	---	
$T_{d(off)}$	Turn-off Delay Time		---	88	---	
T_f	Turn-off Fall Time		---	18	---	
Q_g	Total Gate Charge	$V_{GS}=10V, V_{DD}=100V, I_D=55A$	---	145	---	nC
Q_{gs}	Gate-Source Charge		---	49	---	
Q_{gd}	Gate-Drain Charge		---	27	---	
Source-Drain Characteristics						
I_S	Continuous Source Current		--	---	110	A
V_{SD}	Diode Forward Voltage	$I_S=70A, V_{GS}=0V$	---	---	1.2	V
t_{rr}	Reverse recovery time	$I_F=55A, diF/dt=100A/\mu s$	---	185	---	ns
Q_{rr}	Reverse recovery charge		---	469	---	nC

Note ④: Pulse test (pulse width $\leq 300\mu s$, duty cycles $\leq 2\%$).

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



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Typical Characteristics

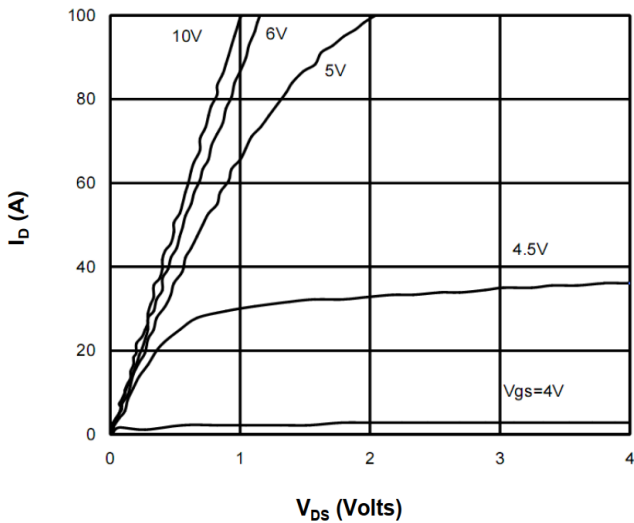


Figure 1: On-Region Characteristics

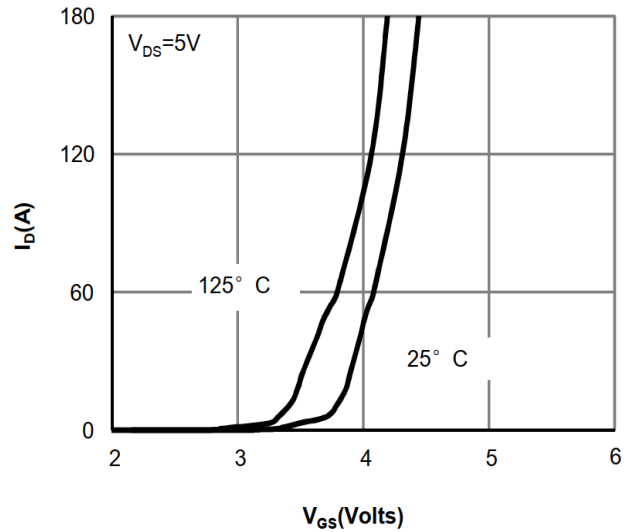


Figure 2: Transfer Characteristics

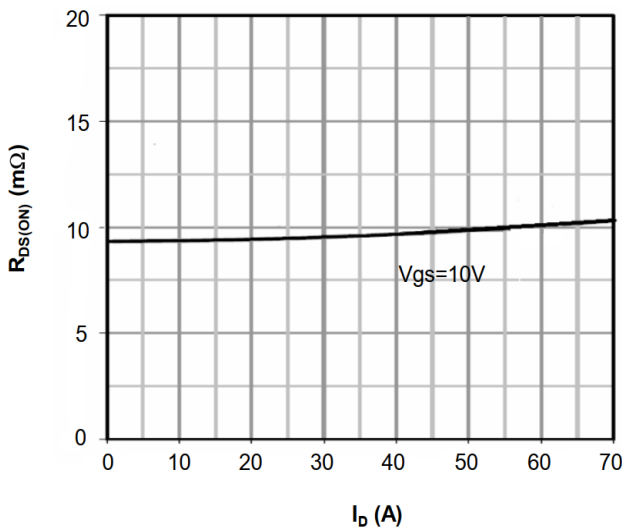


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

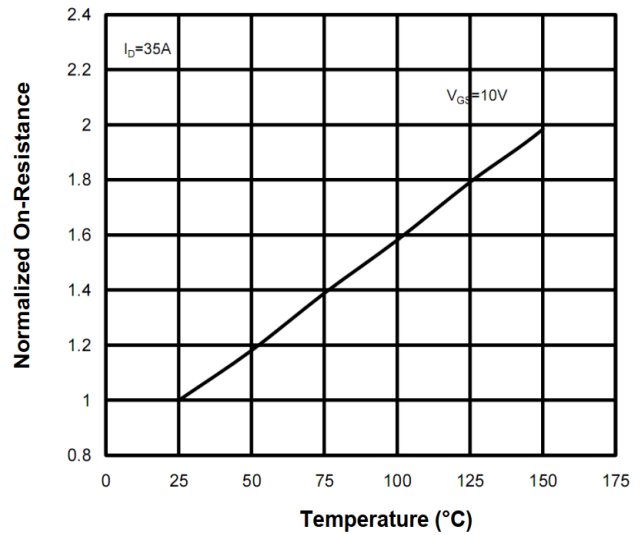


Figure 4: On-Resistance vs. Junction Temperature

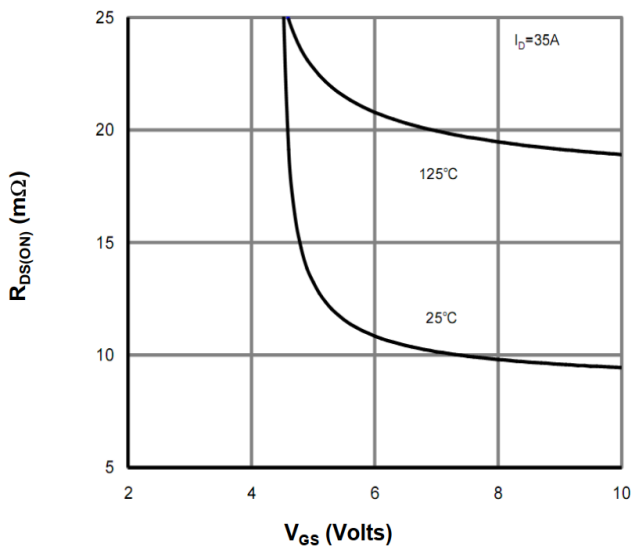


Figure 5: On-Resistance vs. Gate-Source Voltage

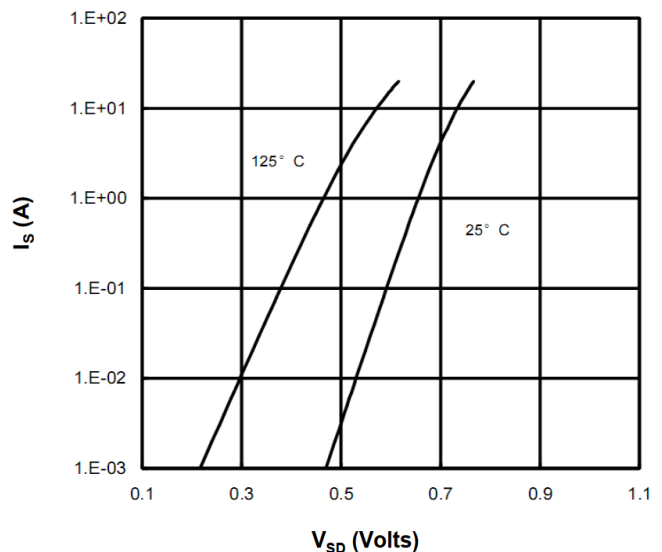


Figure 6: Body-Diode Characteristics



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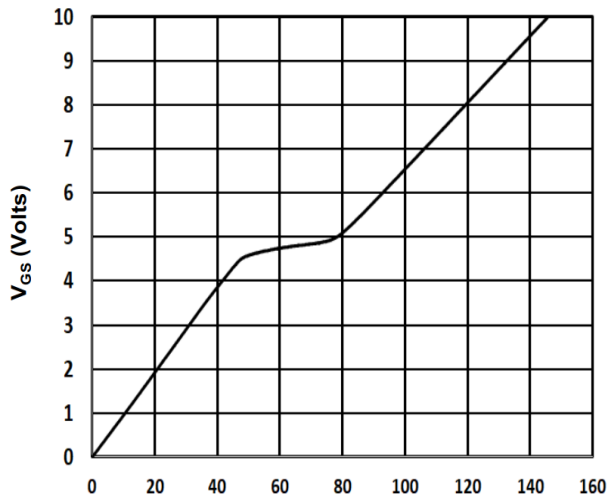


Figure 7: Gate-Charge Characteristics

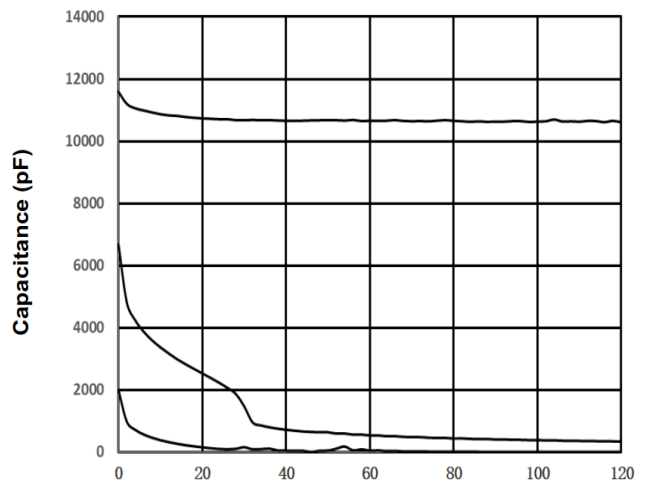


Figure 8: Capacitance Characteristics

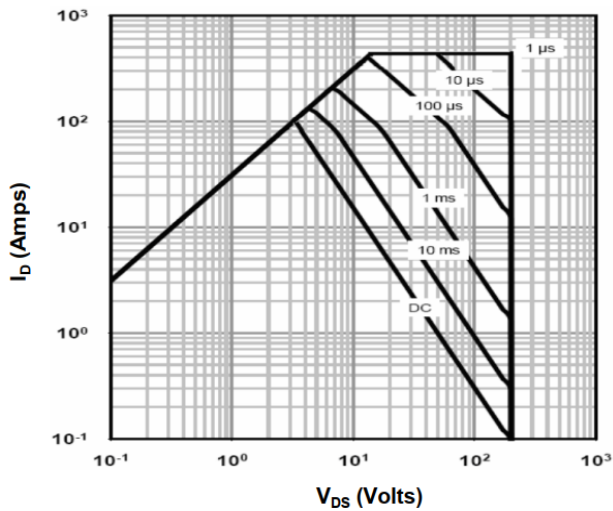
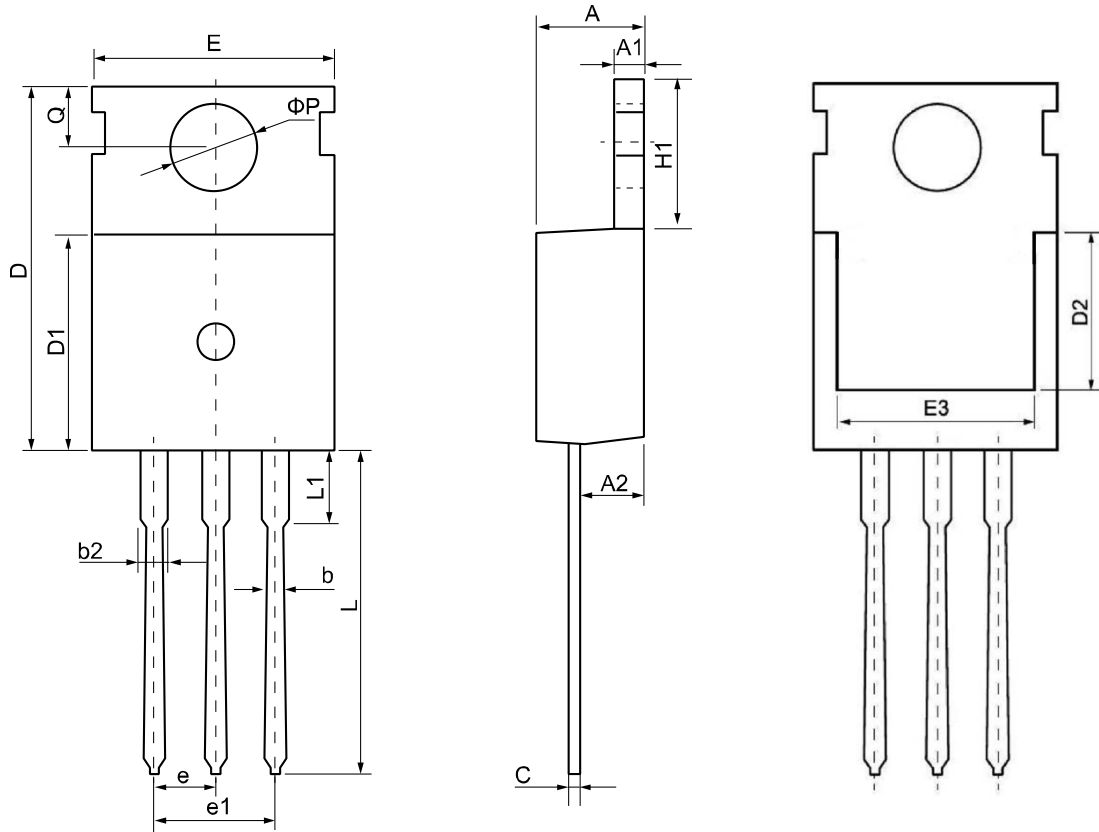


Figure 9: Maximum Forward Biased Safe Operating Area

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TO-220 Package Outline Data


Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	4.30	4.55	4.75	E	9.65	10.00	10.25
A1	1.15	1.30	1.45	E3	7.00	--	--
A2	2.20	2.40	2.60	e	2.54 BSC		
b	0.70	0.80	0.95	e1	5.08 BSC		
b2	1.17	1.27	1.47	H1	6.30	6.50	6.80
c	0.40	0.50	0.65	L	12.70	13.50	14.10
D	15.30	15.60	15.90	L1	--	3.20	3.95
D1	8.90	9.10	9.35	ϕP	3.40	3.60	3.80
D2	5.50	--	--	Q	2.60	2.80	3.00