

N-Channel Enhancement Mode MOSFET

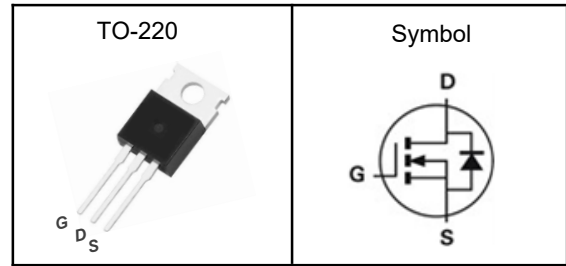
Features

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

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



V_{DSS}	100	V
$R_{DS(ON)-Typ}$	5.0	m Ω
I_D	180	A

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

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	100	V
V_{GSS}	Gate-Source Voltage	± 20	V
T_J	Maximum Junction Temperature	-55 to 175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
E_{AS}	Single Pulse Avalanche Energy	380	mJ
$I_{DM}^{①}$	Pulse Drain Current Tested	560	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	40	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.48	$^\circ\text{C}/\text{W}$

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.



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	100	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =100V, 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	---	5.0	6.5	mΩ
Dynamic Characteristics^⑤						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =50V, Freq.=1MHz	---	13000	---	pF
C _{oss}	Output Capacitance		---	500	---	
C _{rss}	Reverse Transfer Capacitance		---	400	---	
T _{d(on)}	Turn-on Delay Time	V _{DD} =50V, V _{GS} =10V, R _G =3Ω, I _D =20A	---	24	---	nS
T _r	Turn-on Rise Time		---	78	---	
T _{d(off)}	Turn-off Delay Time		---	98	---	
T _f	Turn-off Fall Time		---	80	---	
Q _g	Total Gate Charge	V _{DS} =50V, V _{GS} =10V, I _D =20A	---	110	---	nC
Q _{gs}	Gate-Source Charge		---	30	---	
Q _{gd}	Gate-Drain Charge		---	40	---	
Source-Drain Characteristics (T_J=25°C)						
V _{SD}	Diode Forward Voltage ₂	V _{GS} =0V, I _S =20A, T _J =25°C	---	---	1.3	V

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 Output Characteristics

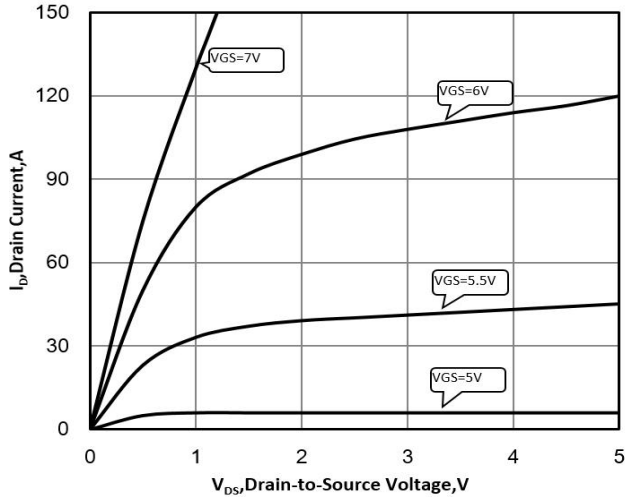


Figure 2 Transfer Characteristics

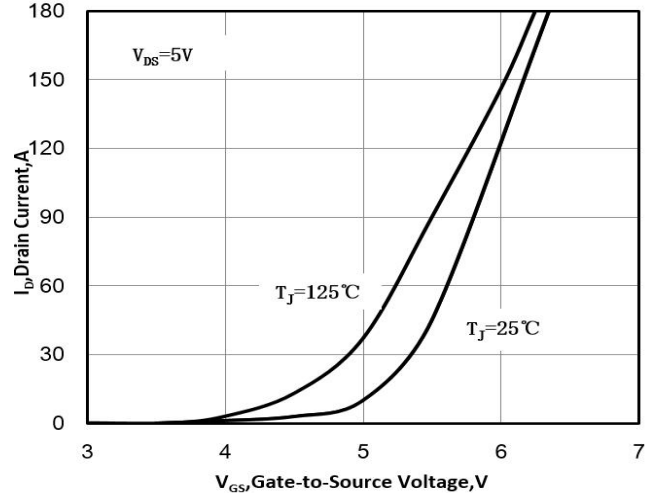


Figure 3 On-Resistance vs. ID and VGS

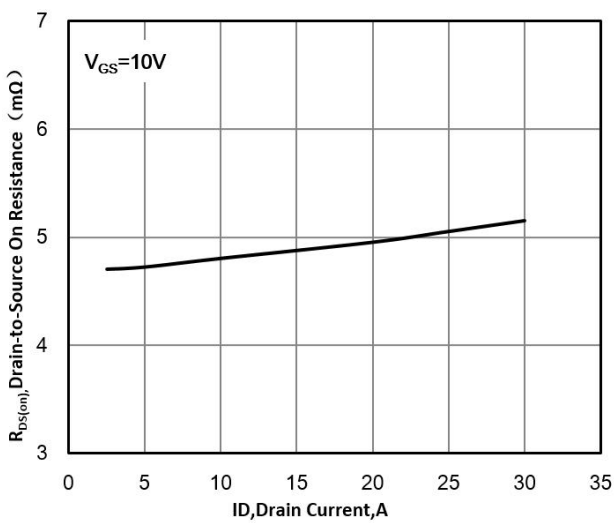


Figure 4 On-Resistance vs. Junction Temperature

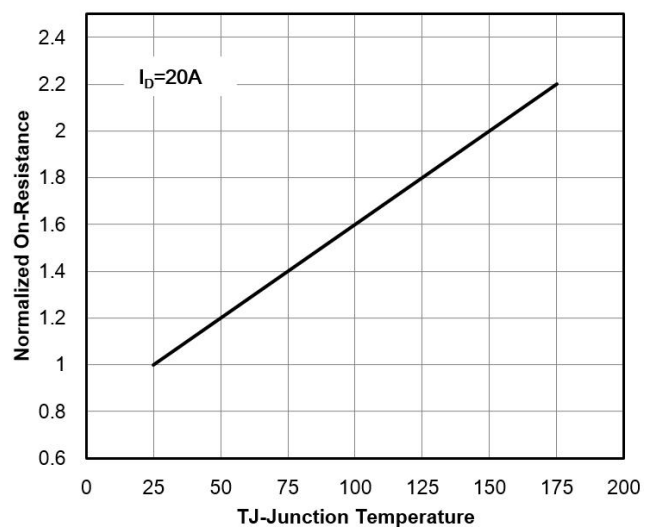


Figure 5 On-Resistance vs. VGS

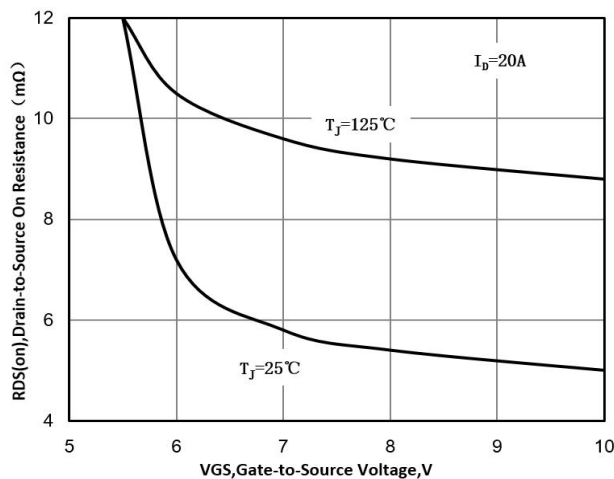
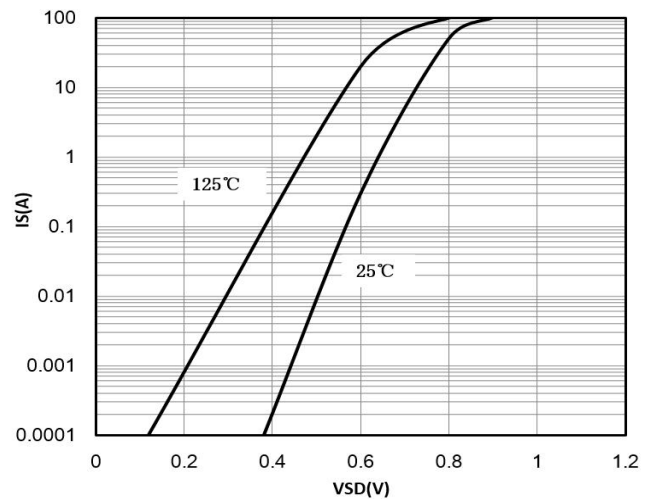
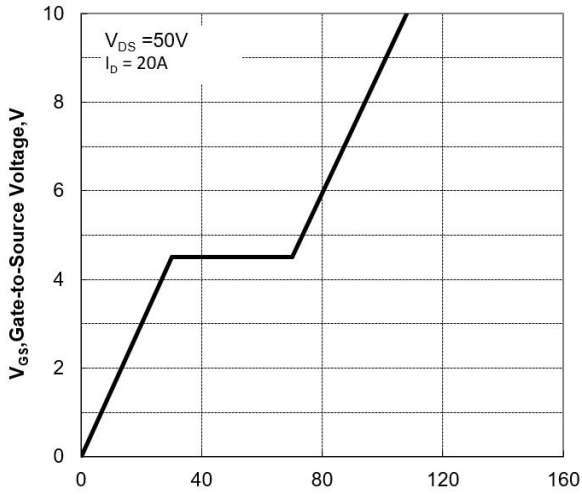
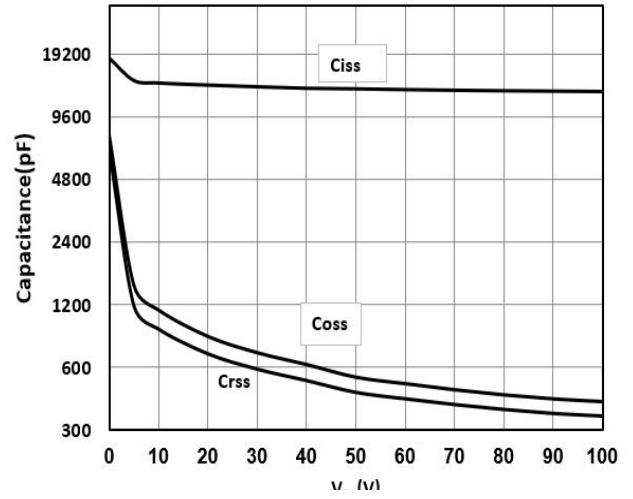
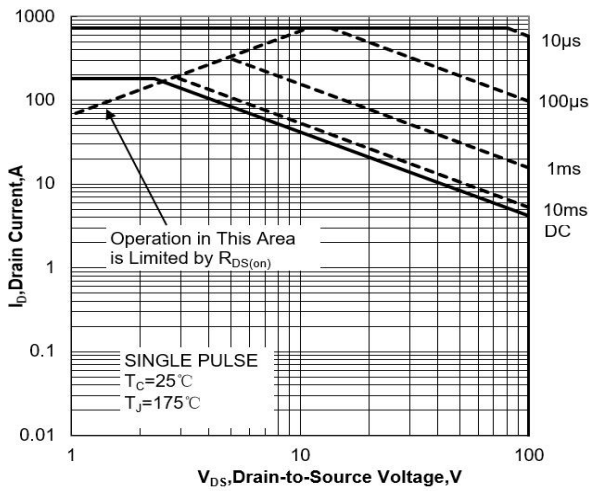
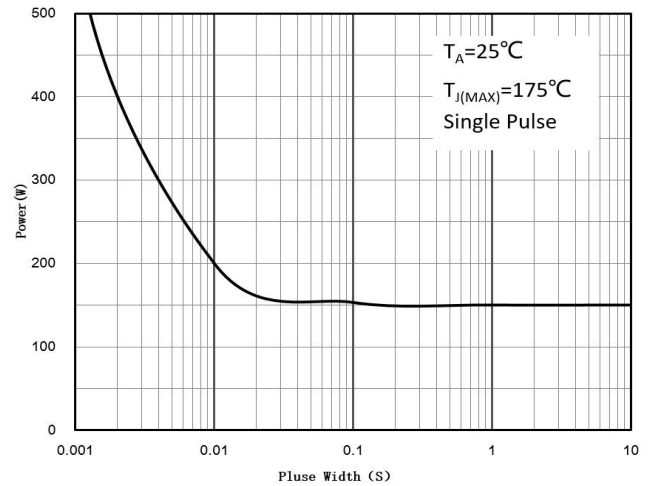
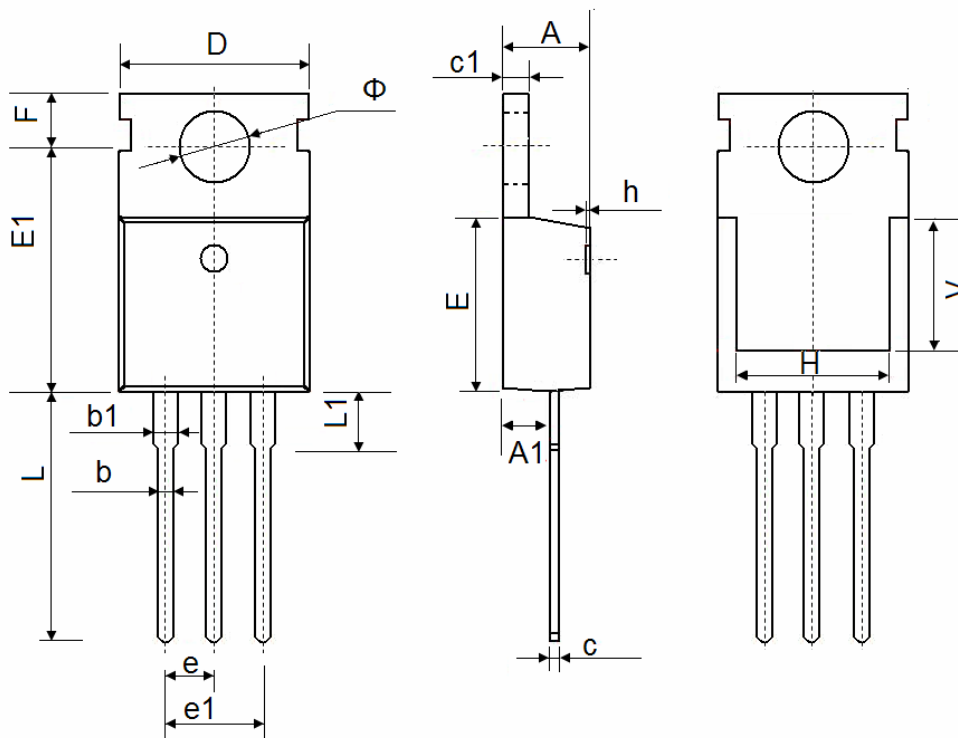


Figure 6 Body Diode Forward Voltage



N-Channel Enhancement Mode MOSFET
Figure 7 Gate-Charge Characteristics

Figure 8 Capacitance Characteristics

Figure 9 Maximum Forward Biased Safe Operation Area

Figure 10 Single Pulse Power Rating Junction-to-Ambient


N-Channel Enhancement Mode MOSFET
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