

60V N-Channel Enhancement Mode MOSFET

Description

The AP100N06F/P/T uses advanced **APM-SGT II** technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

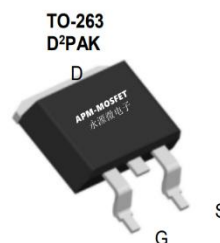
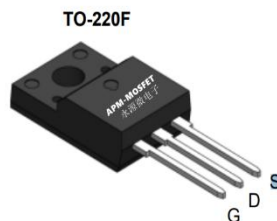
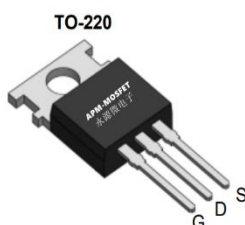
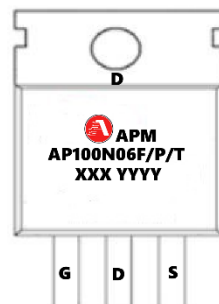
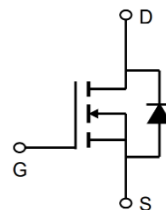
$V_{DS} = 60V$ $I_D = 100A$

$R_{DS(ON)} < 5.8m\Omega$ @ $V_{GS}=10V$ (**Type: 4.8mΩ**)

Application

Battery protection

UPS



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP100N06F	TO-220F-3L	AP100N06F XXX YYYY	1000
AP100N06P	TO-220-3L	AP100N06P XXX YYYY	1000
AP100N06T	TO-263-3L	AP100N06T XXX YYYY	800

Absolute Maximum Ratings ($T_c=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_c=25^\circ\text{C}$	Continuous Drain Current ^{1,6}	100	A
$I_D@T_c=100^\circ\text{C}$	Continuous Drain Current ^{1,6}	54	A
I_{DM}	Pulsed Drain Current ²	400	A
E_{AS}	Single Pulse Avalanche Energy ³	580	mJ
I_{AS}	Avalanche Current	22	A
$P_D@T_c=25^\circ\text{C}$	Total Power Dissipation ⁴	78	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	58	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	1.6	$^\circ\text{C/W}$

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Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	VGS = 0V, ID = 250 μ A	60	-	-	V
IGSS	Gate-body Leakage Current	VDS = 0V, VGS = $\pm$ 20V	-	-	$\pm$ 100	nA
IDSS TJ=25°C	Zero Gate Voltage Drain Current	VDS = 65V, VGS = 0V			1	μ A
IDSS TJ=100°C					100	μ A
VGS(th)	Gate-Threshold Voltage	VDS = VGS, ID = 250 μ A	2.0	3.0	4.0	V
RDS(on)	Drain-Source On-Resistance ⁴	VGS = 10V, ID = 20A	-	4.8	6.4	m Ω
gfs	Forward Transconductance ⁴	VDS = 10V, ID = 20A	-	58	-	S
Ciss	Input Capacitance	VDS = 30V, VGS = 0V, f = 1MHz	-	1230	-	pF
Coss	Output Capacitance		-	470	-	
Crss	Reverse Transfer Capacitance		-	22	-	
RG	Gate Resistance	f = 1MHz	-	1.8	-	Ω
Qg	Total Gate Charge	VGS = 10V, VDS = 30V, ID = 20A	-	19	-	nC
Qgs	Gate-Source Charge		-	5.4	-	
Qgd	Gate-Drain Charge		-	4.9	-	
td(on)	Turn-on Delay Time	VGS = 10V, VDD = 30V, RG = 3 Ω , ID = 20A	-	9.5	-	ns
tr	Rise Time		-	5	-	
td(off)	Turn-off Delay Time		-	16.5	-	
tf	Fall Time		-	6	-	
trr	Body Diode Reverse Recovery Time	IF = 20A, di/dt = 100A/ μ s	-	38	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	30	-	nC
VSD	Diode Forward Voltage ⁴	IS = 20A, VGS = 0V	-	-	1.2	V
IS	Continuous Source Current	TC=25°C			100	A

Note :

- 1、The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width .The EAS data shows Max. rating .
- 3、The power dissipation is limited by 175°C junction temperature
- 4、EAS condition: TJ=25°C, VDD=48V, VG=10V, RG=25 Ω , L=0.1mH, IAS= 22A
- 5、The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Characteristics

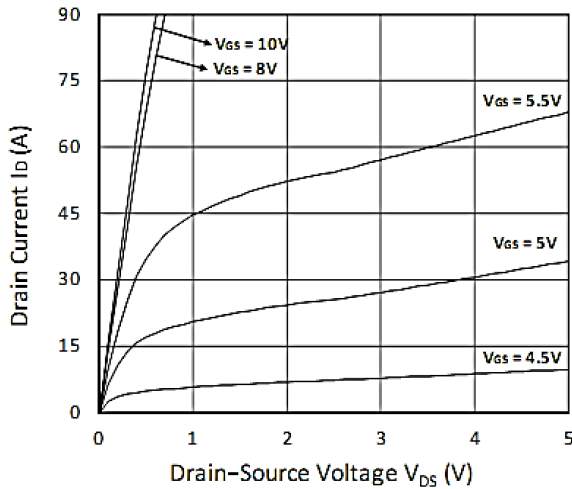


Figure 1. Output Characteristics

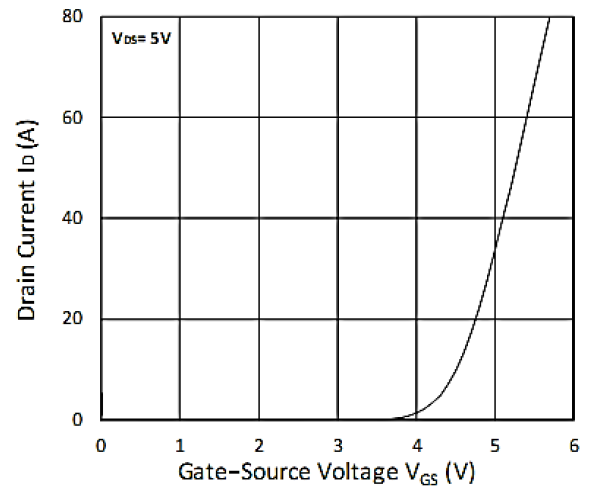


Figure 2. Transfer Characteristics

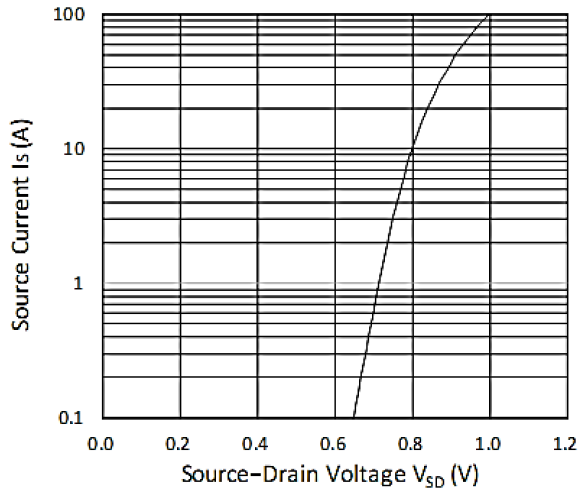


Figure 3. Forward Characteristics of Reverse

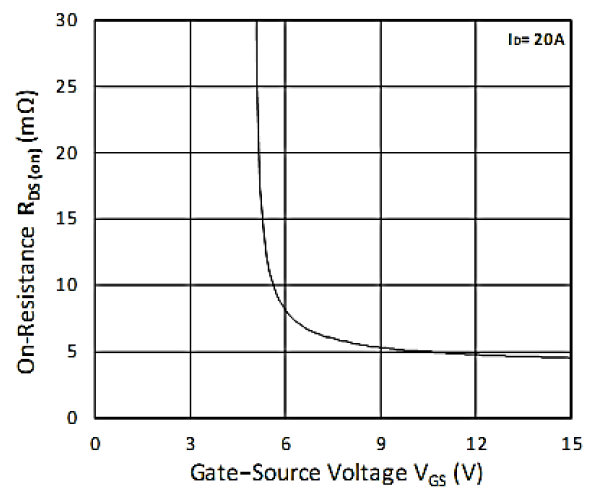


Figure 4. R_DS(ON) vs. V_GS

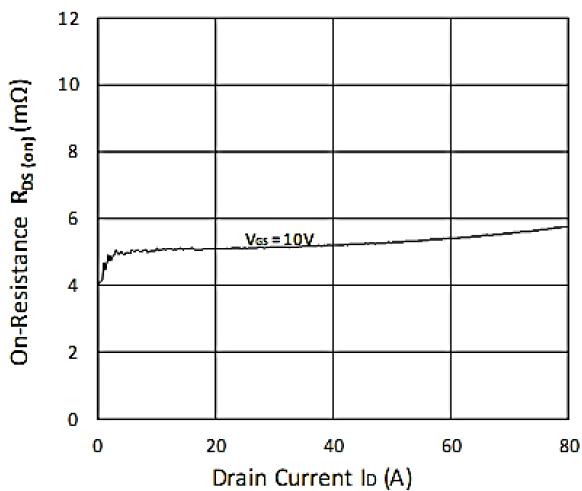


Figure 5. R_DS(ON) vs. I_D

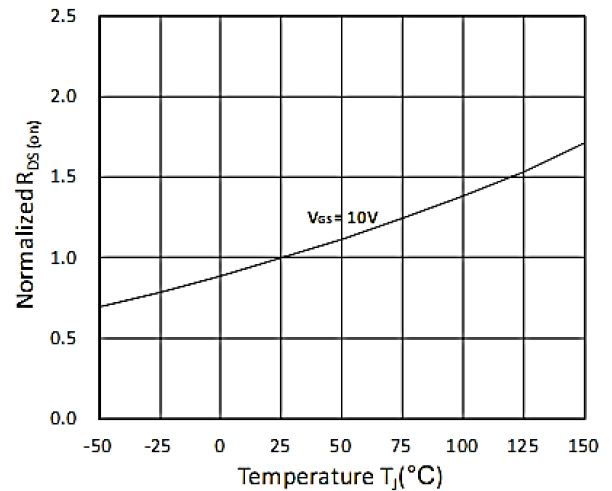


Figure 6. Normalized R_DS(on) vs. Temperature

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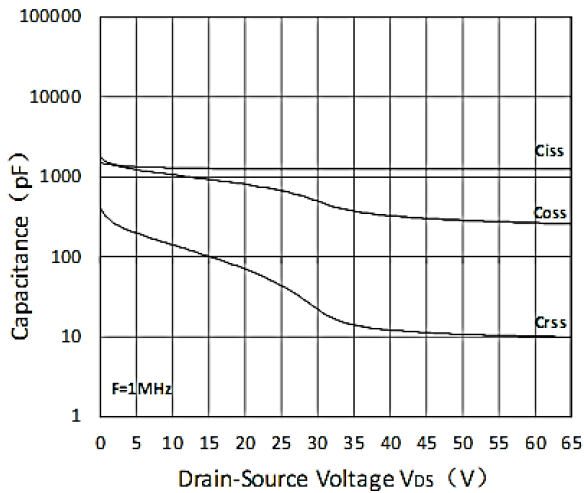


Figure 7. Capacitance Characteristics

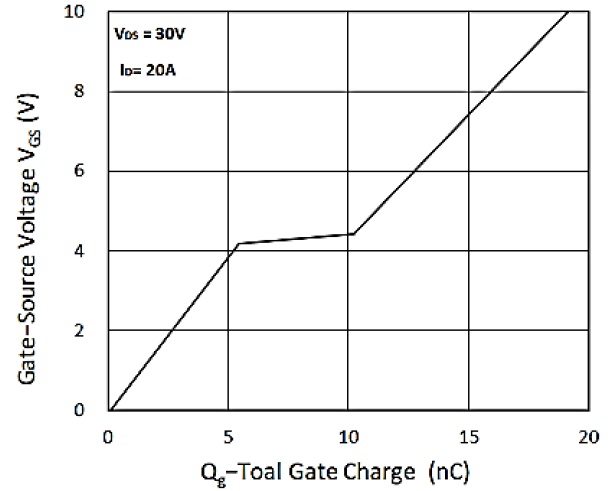


Figure 8. Gate Charge Characteristics

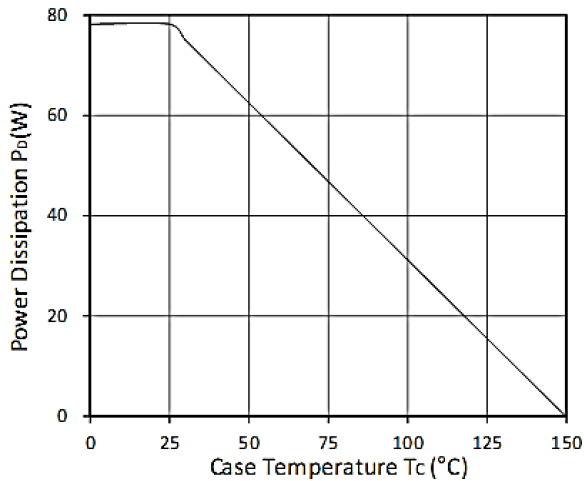


Figure 9. Power Dissipation

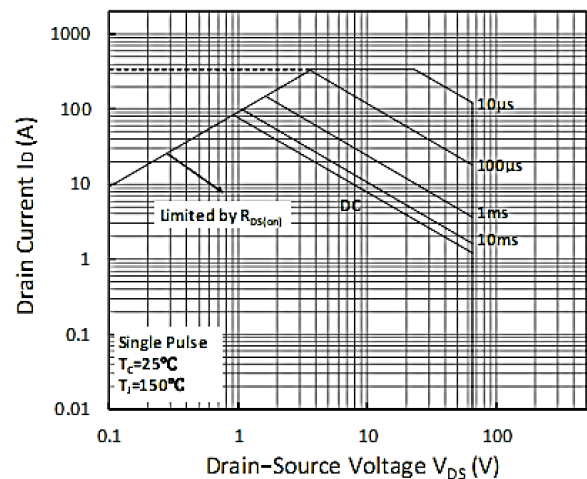


Figure10. Safe Operating Area

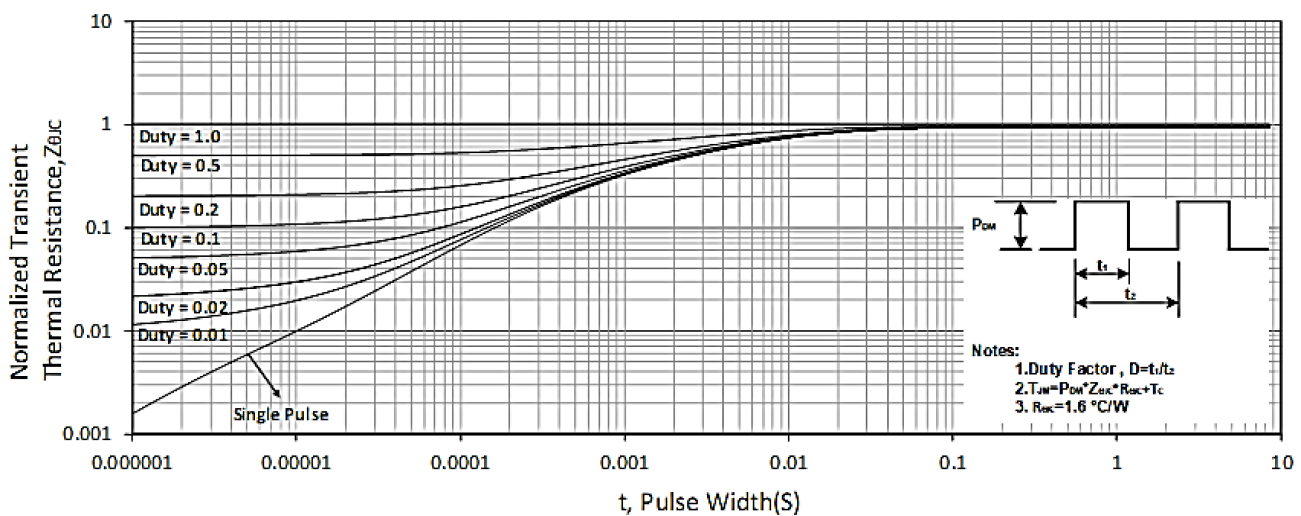
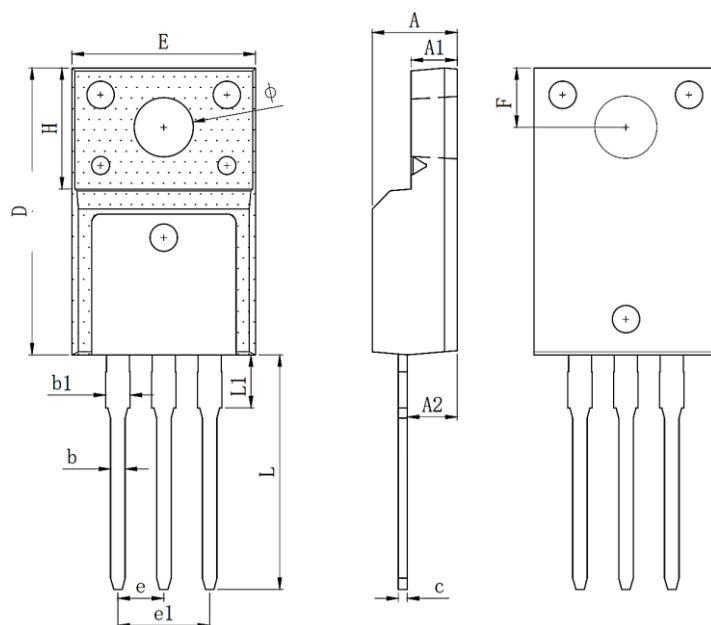


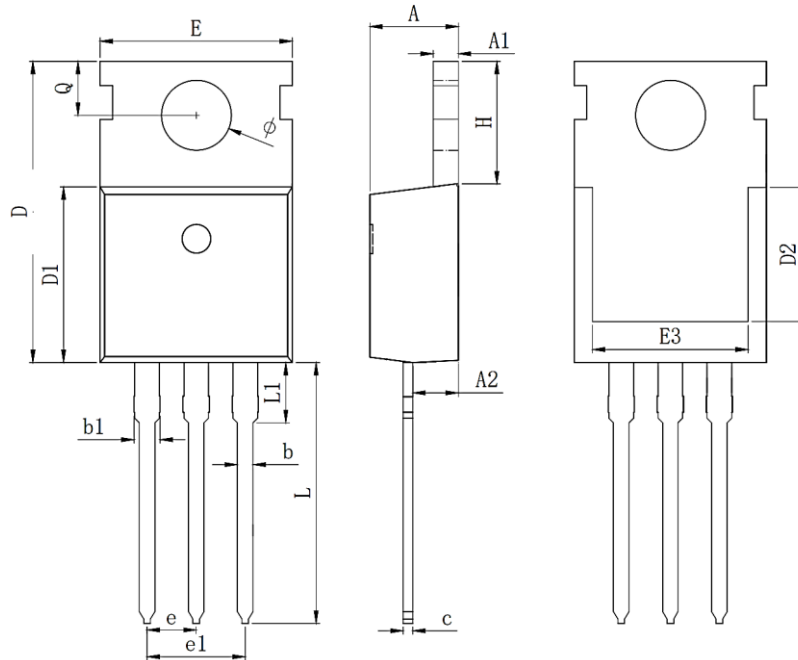
Figure 11. Normalized Maximum Transient Thermal Impedance

Package Mechanical Data:TO-220F-3L



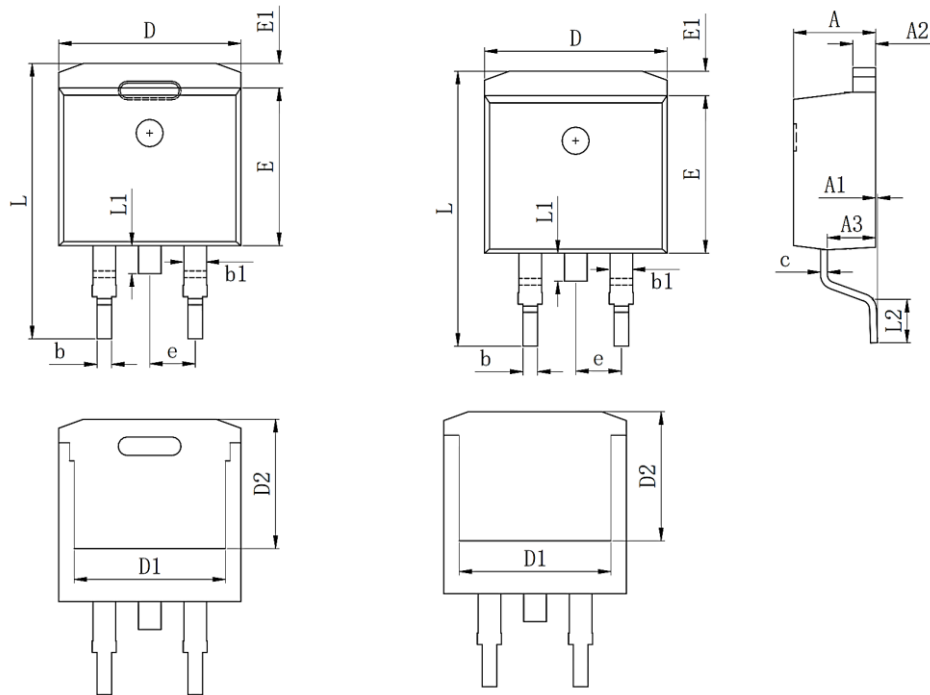
Symbol	Dim in mm		
	Min	Typ	Max
A	4.5	4.7	5.0
A1	2.34	2.54	2.84
A2	2.4	2.9	3.4
b	0.7	0.8	0.95
b1	1.05	1.35	1.55
c	0.4	0.5	0.65
D	15.57	15.87	16.17
H	6.7REF		
E	9.86	10.16	10.46
e	2.54BSC		
e1	5.08BSC		
L	12.65	12.98	13.3
L1	2.78	3.08	3.38
F	3.15	3.3	3.55
φ	3	3.3	3.65

Package Mechanical Data:TO-220C-3L



Symbol	Dim in mm		
	Min	Typ	Max
A	4.25	4.5	4.7
A1	1.15	1.3	1.45
A2	2.15	2.35	2.55
b	0.65	0.8	0.95
b1	1.15	1.35	1.55
c	0.35	0.5	0.65
D	14.3	15.3	16.3
D1	8.8	9.1	9.4
D2	6.3REF		
E	9.7	10	10.3
E3	7	8	9
e	2.54BSC		
e1	5.08BSC		
L	12.7	13.5	13.9
L1		3.1	3.4
H	6	6.5	6.85
Q	2.6	2.8	3
φ	3.4	3.6	3.8

Package Mechanical Data:TO-263C-3L



Symbol	Dim in mm		
	Min	Typ	Max
A	4.37	4.57	4.77
A1	0		0.25
A2	1.22	1.27	1.42
A3	2.49	2.69	2.89
b	0.7	0.81	0.96
b1	1.17	1.27	1.47
c	0.3	0.38	0.53
D	9.86	10.16	10.36
D1	8.4REF		
D2	7.073REF		
E	8.5	8.7	8.9
E1	1.07	1.27	1.47
e	2.54BSC		
L	17.7	15.1	15.5
L1	1.4	1.55	1.7
L2	2	2.3	2.6
H	6	6.5	6.85
Q	2.6	2.8	3
φ	3.4	3.6	3.8

60V N-Channel Enhancement Mode MOSFET**Attention**

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Edition	Date	Change
REV1.0	2023/3/20	Initial release

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