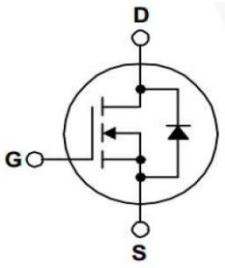
迈诺斯科技

STD20NF06L

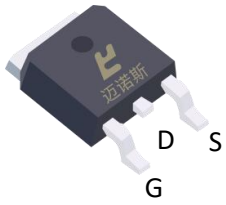
60V N-Channel Power MOSFET

Description

The STD20NF06L uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.



Schematic diagram



TO-252

General Features

① V_{DS}=60V,I_D=20A
$R_{DS(ON)}$ < 35mΩ @ V_{GS}=10V
② Special process technology for high ESD capability
③ High density cell design for ultra low R_{dson}
④ Fully characterized avalanche voltage and current
⑤ Good stability and uniformity with high EAS
⑥ Excellent package for good heat dissipation

Application

① Power switching application
② Hard switched and High frequency circuits
③ Uninterruptible power supply

Package Marking And Ordering Information

Ordering Codes	Package	Product Code	Packing
STD20NF06L	TO-252	STD20NF06L	Reel

ABSOLUTE RATINGS (at T_C=25°C unless otherwise specified)

Symbol	Parameter	Value	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current-Continuous	20	A
I_{DM}	Drain Current-Pulsed (Note 1)	80	A
P_D	Maximum Power Dissipation(Tc=25℃)	44	W
E_{AS}	Single pulse avalanche energy(Note 2)	56	mJ
T_J,T_{STG}	Operating Junction and Storage Temperature Range	-55 To 175	℃

Thermal Characteristic

Symbol	Parameter	Typ	Units
$R_{\theta JC}$	Junction-to-Case	3.4	℃/W

Electrical Characteristics (Tc=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Units
Off Characteristics						
B_{VDSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,V_{GS}=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.0	1.8	2.4	V
$R_{DS(ON)}$	Drain-Source On-State Resistance(Note 3)	V_{GS}=10V, I_D=10A	--	25	35	mΩ
G_{FS}	Forward Transconductance	V_{DS}=5V,I_D=10A	--	11	--	S
Dynamic Characteristics						
C_{lss}	Input Capacitance	V_{DS}=25V,V_{GS}=0V, F=1.0MHz	--	670	--	pF
C_{oss}	Output Capacitance		--	76	--	pF
C_{rss}	Reverse Transfer Capacitance		--	66	--	pF
Switching Characteristics (Note 4)						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=30V,I_D=10A, V_{GS}=10V,R_{GEN}=10Ω	--	19.2	--	nS
t_r	Turn-on Rise Time		--	6.4	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	29.2	--	nS
t_f	Turn-Off Fall Time		--	8.2	--	nS
Q_g	Total Gate Charge	V_{DS}=48V,I_D=10A V_{GS}=10V	--	21	--	nC
Q_{gs}	Gate-Source Charge		--	5	--	nC
Q_{gd}	Gate-Drain Charge		--	6.5	--	nC
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage(Note 3)	V_{GS}=0V,I_S=20A	--	--	1.2	V
T_{rr}	Reverse Recovery Time	T_j=25℃， I_F=10A， di/dt=100A/uS（note3）	--	33.6	--	ns
Q_{rr}	Reverse Recovery Charge		--	32.1	--	nc

Notes:

1.Repetitive Rating: Pulse width limited by maximum junction temperature.
2.EAS condition :T_j=25℃,V_{DD}=30V,V_G=10V,L=0.5mH,Rg=25Ω
3.Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4.Guaranteed by design, not subject to production.

Characteristics Curves

Figure 1 Output Characteristics	Figure 2 Transfer Characteristics

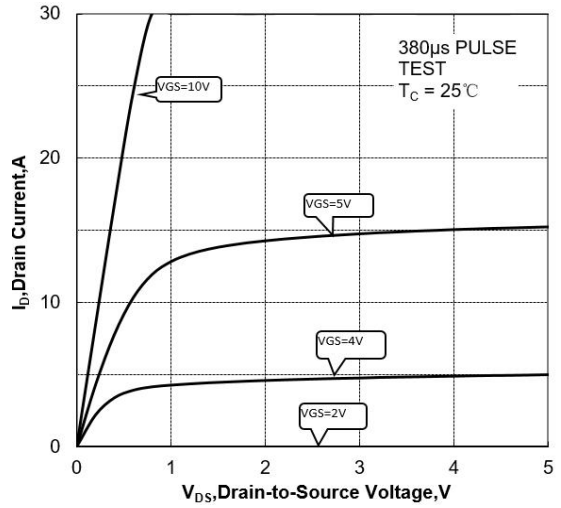
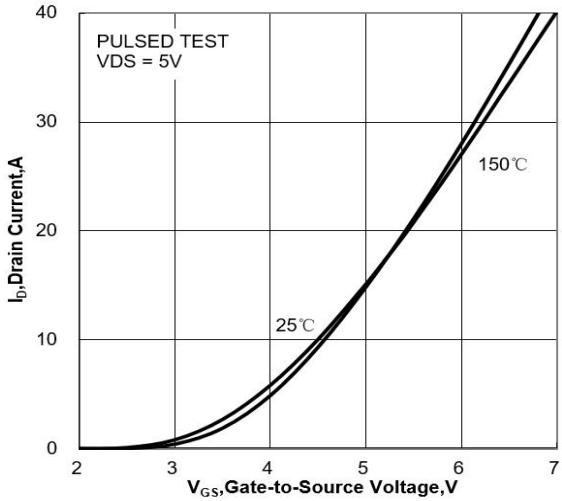

	

Figure 3 On-Resistance vs. ID and VGS	**Figure 4 On-Resistance vs. Junction Temperature**

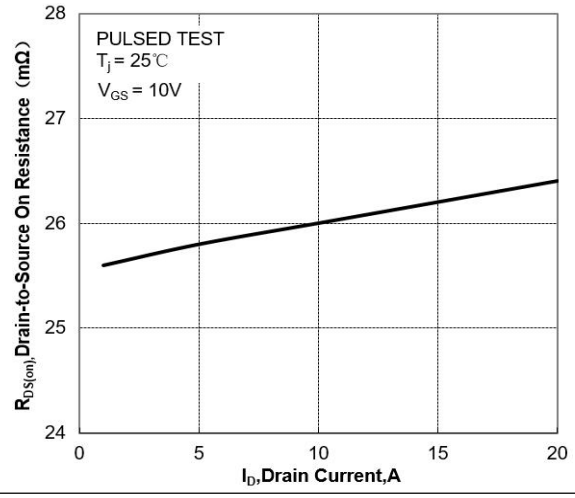
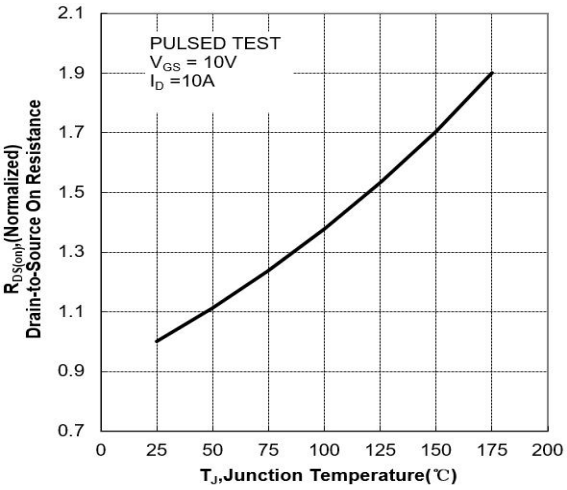

	

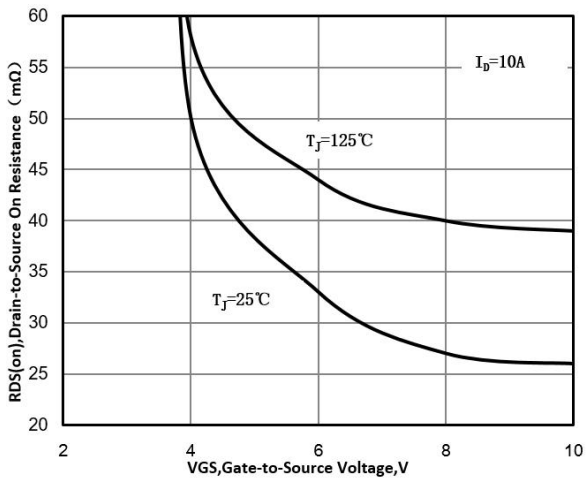
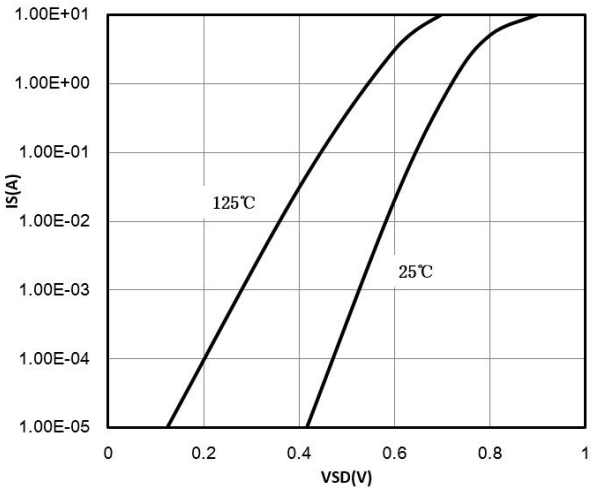
Figure 5 On-Resistance vs. VGS	**Figure 6 Body Diode Forward Voltage**
	

Figure 7 Gate-Charge Characteristics

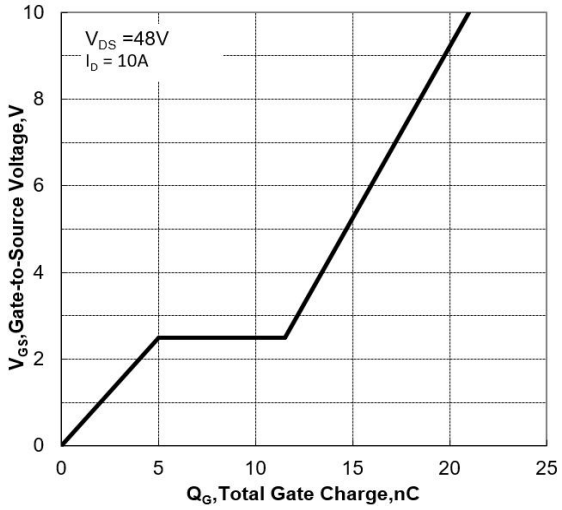


Figure 8 Capacitance Characteristics

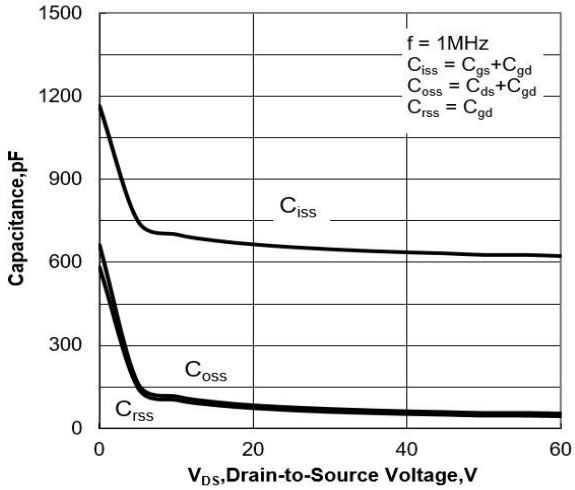


Figure 9 Maximum Forward Biased Safe Operation Area

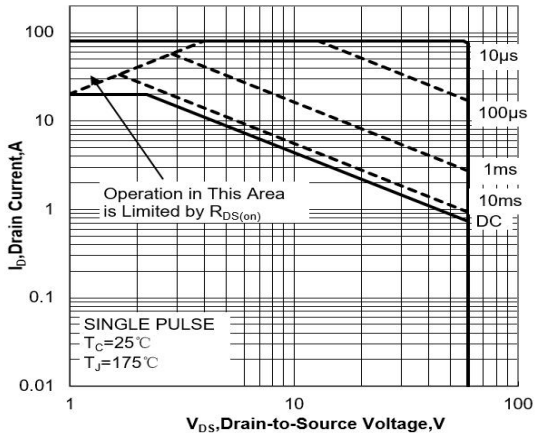


Figure 10 Single Pulse Power Rating Junction-to-Ambient

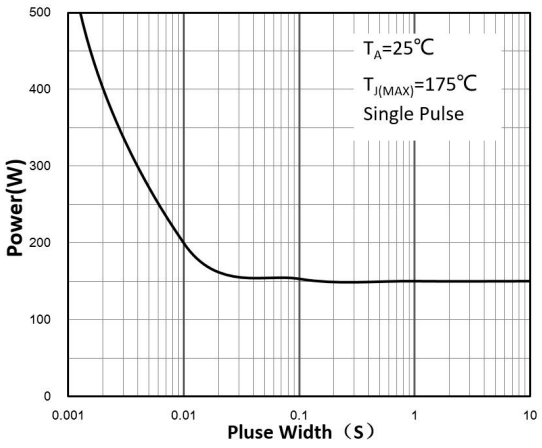
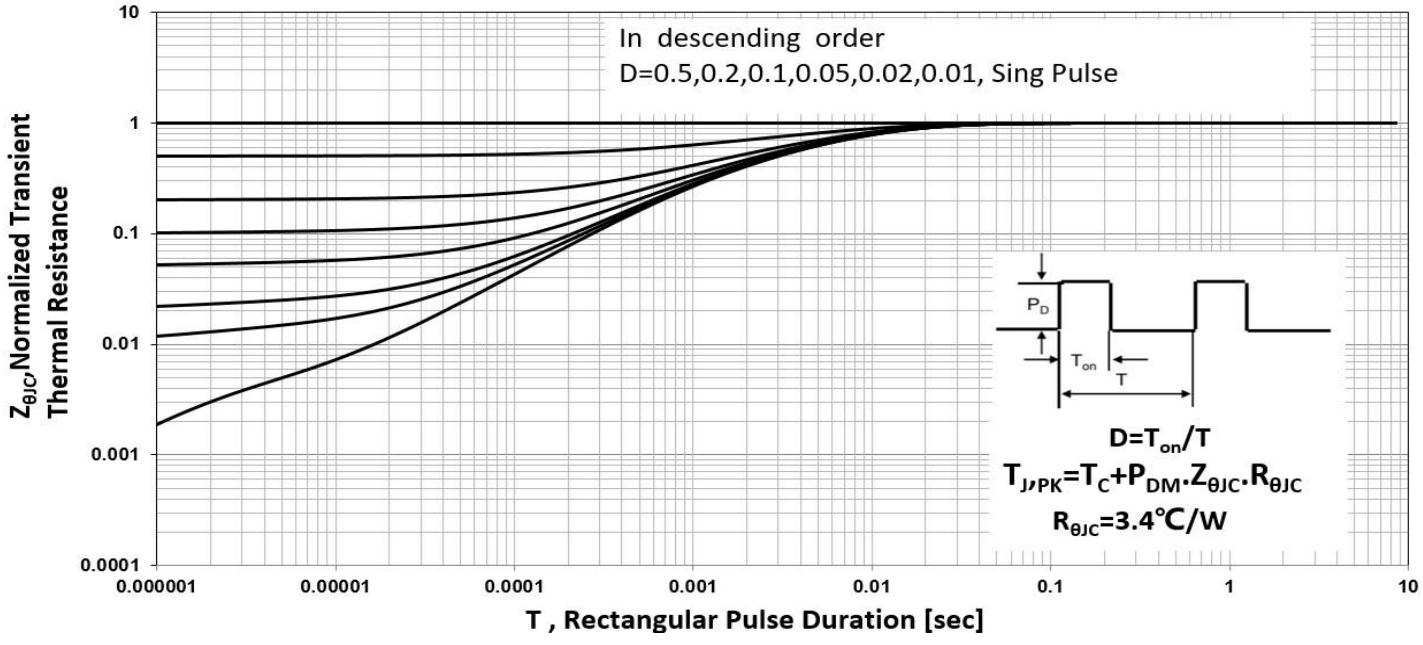
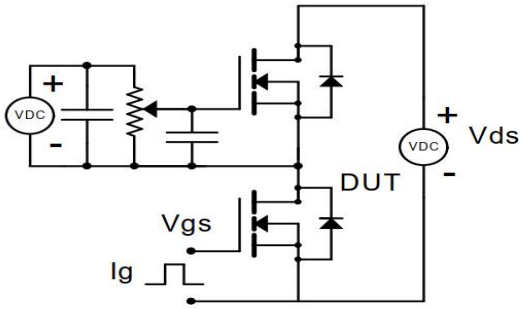
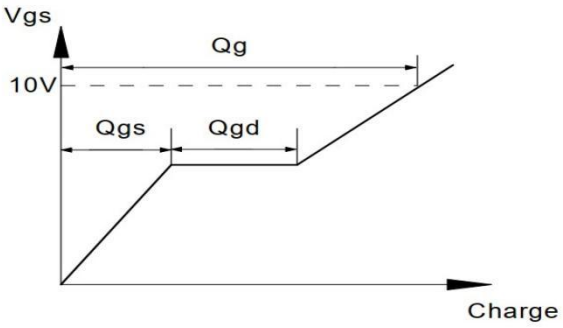
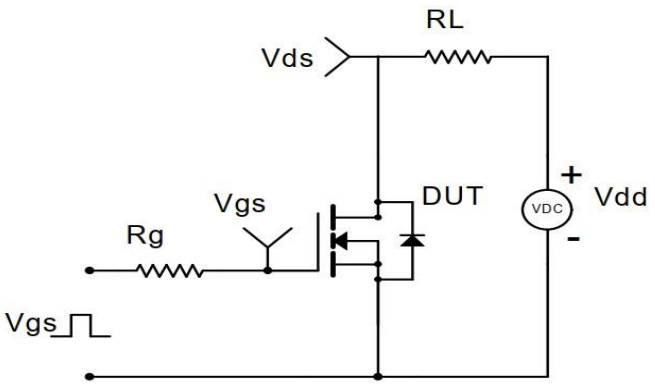
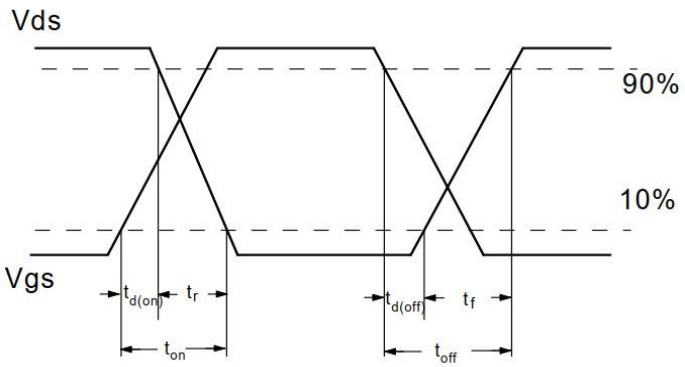
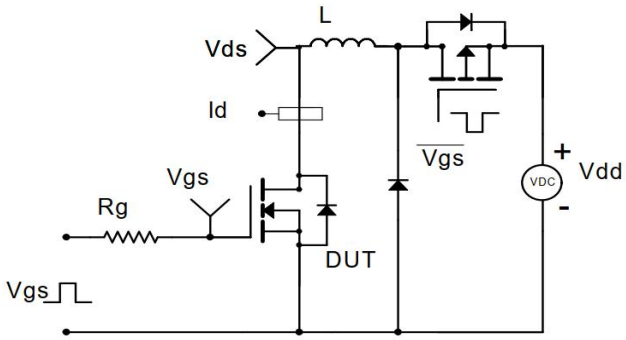
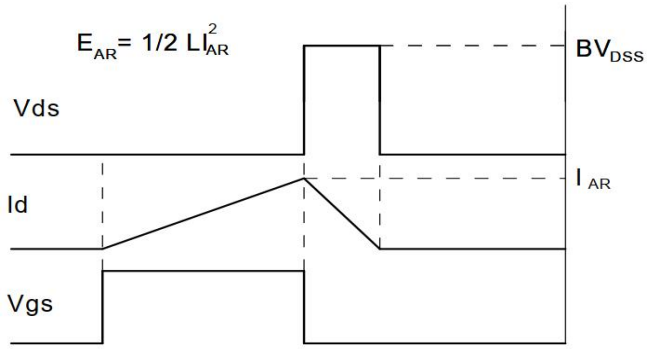
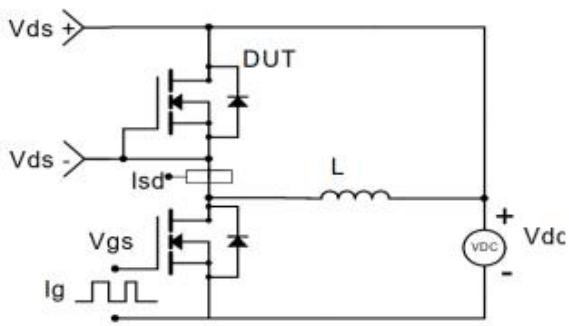
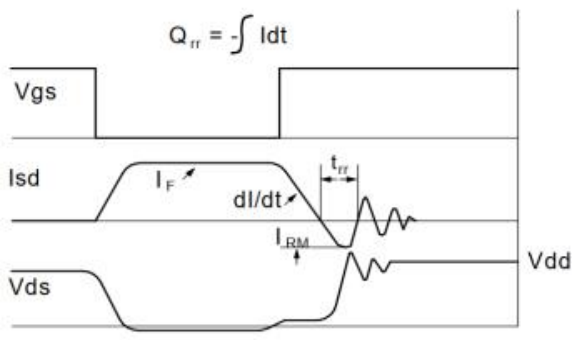


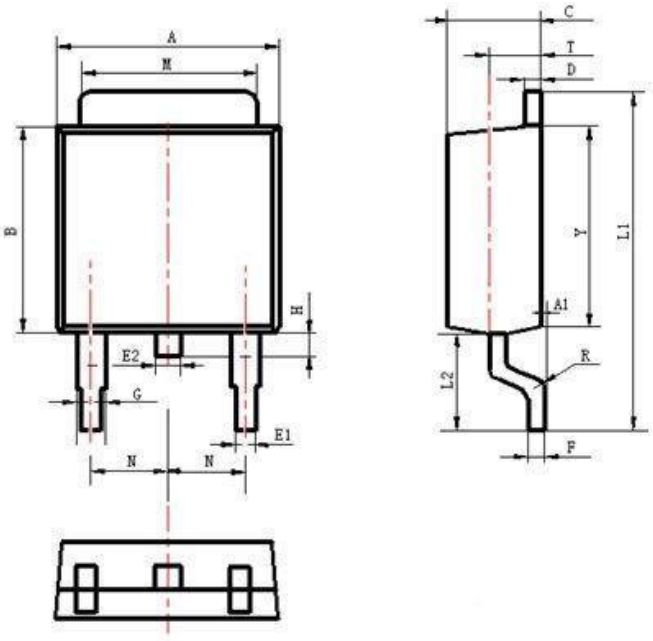
Figure 11 Normalized Maximum Transient Thermal Impedance



Test Circuit and Waveform

Gate Charge Test Circuit	Gate Charge Test Waveform
	
Resistive Switching Test Circuit	**Resistive Switching Test Waveforms**
	
Unclamped Inductive Switching (UIS) Test Circuit	**Unclamped Inductive Switching (UIS) Test Waveforms**
	
Diode Recovery Test Circuit	**Diode Recovery Test Waveforms**
	

Package Description



Items	Values(mm)	
	MIN	MAX
A	6.30	6.90
A1	0	0.13
B	5.70	6.30
C	2.10	2.50
D	0.30	0.60
E1	0.60	0.90
E2	0.70	1.00
F	0.30	0.60
G	0.70	1.20
L1	9.60	10.50
L2	2.70	3.10
H	0.60	1.00
M	5.10	5.50
N	2.09	2.49
R	0.3	
T	1.40	1.60
Y	5.10	6.30

TO-252 Package

NOTE:

1. Exceeding the maximum ratings of the device in performance may cause damage to the device, even the permanent failure, which may affect the dependability of the machine. Please do not exceed the absolute maximum ratings of the device when circuit designing.
2. When installing the heat sink, please pay attention to the torsional moment and the smoothness of the heat sink.
3. MOSFETs is the device which is sensitive to the static electricity, it is necessary to protect the device from being damaged by the static electricity when using it.
4. Shenzhen Minos reserves the right to make changes in this specification sheet and is subject to change withoutprior notice.

CONTACT:

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