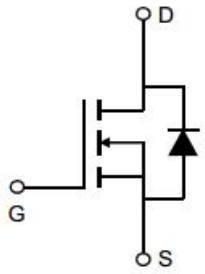
迈诺斯科技

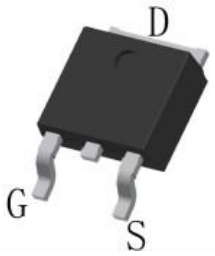
MDT7N65

Silicon N-Channel Power MOSFET

Description

MDT7N65, This Power MOSFET is produced using Wisdom's advanced planar stripe, DMOS technology. This latest technology has been especially designed to minimize on-state resistance, have a high rugged avalanche characteristics. These devices are well suited for high efficiency switch mode power supplies, active power factor correction, electronic lamp ballasts based on half bridge topology.





TO-252

KEY CHARACTERISTICS

① V_{DS} = 650V,I_D = 7A $R_{DS(ON)}$ <1.2Ω @ V_{GS}=10V
② Gate Charge (Typical 28nC)
③ Improved dv/dt Capability, High Ruggedness
④ 100% Avalanche Tested
⑤ Maximum Junction Temperature Range (150°C)

ORDERING INFORMATION

Ordering Codes	Package	Product Code	Packing
MDT7N65	TO-252	MDT7N65	Tube

ABSOLUTE RATINGS at TC=25°C,unless otherwise specified

Symbol	Parameter	Rating	Units
V_{DSS}	Drain-to-Source Voltage	650	V
I_D	Continuous Drain Current	7	A
	Continuous Drain Current TC = 100 °C	4.4	A
I_{DM}	Pulsed Drain Current(Note1)	28	A
V_{GS}	Gate-to-Source Voltage	±30	V
E_{AS}	Single Pulse Avalanche Energy(Note2)	420	mJ
dv/dt	Peak Diode Recovery dv/dt(Note3)	4.5	V/ns
P_D	Power DissipationTO-252	48	W
	Derating Factor above 25°C	0.38	W/℃

$T_L T_J$， T_{stg}	Operating Junction and Storage Temperature Range	150，–55 to 150	℃
	Maximum Temperature for Soldering	300	℃

Thermal characteristics

Thermal characteristics (No FullPAK) TO-252

Symbol	Parameter	RATINGS	Units
$R_{\theta JC}$	Junction-to-Case	2.6	℃/W
$R_{\theta JA}$	Junction-to-Ambient	62.5	℃/W

Electrical Characteristics At TC=25°C,unless otherwise specified

OFF Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	650	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	Bvdss Temperature Coefficient	ID=250uA, Reference25℃	--	0.6	--	V/℃
I_{DSS}	Drain to Source Leakage Current	V_{DS} =600V, V_{GS}= 0V, T_j = 25℃	--	--	1	μA
		V_{DS} =480V, V_{GS}= 0V, T_j = 125℃	--	--	100	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	V_{GS} =+30V	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS} =-30V	--	--	-100	nA

ON Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V, I_D=3.5A	--	1.0	1.2	Ω
$V_{GS(TH)}$	Gate Threshold Voltage	VDS = VGS, ID = 250μA	2.0	--	4.0	V

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
R_g	Gate resistance	f = 1.0MHz	--	25	--	Ω
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V F = 1.0MHz	--	1100	1500	PF
C_{oss}	Output Capacitance		--	110	150	
C_{rss}	Reverse Transfer Capacitance		--	12	16	

Switching Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	ID =7A VDD = 300V VGS = 10V RG =25Ω	--	15	40	ns
T_r	Rise Time		--	30	70	
$t_{d(OFF)}$	Turn-Off Delay Time		--	110	11	
t_f	Fall Time		--	40	90	
Q_g	Total Gate Charge	ID =7A VDS =480V VGS = 10V	--	28	37	nC
Q_{gs}	Gate to Source Charge		--	5	--	
Q_{gd}	Gate to Drain (“Miller”)Charge		--	11	--	

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)	T_C=25 °C	--	--	7	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	28	A
V_{SD}	Diode Forward Voltage	I_S=7A, V_{GS}=0V	--	--	1.4	V
T_{rr}	Reverse Recovery Time	I_S=7A, $dI_{F/dt}$=100A/us, V_{GS}=0V	--	365	--	ns
Q_{rr}	Reverse Recovery Charge		--	3.4	--	nC

NOTES

1.Repeativity rating : pulse width limited by junction temperature

2.L = 15.7mH, IAS =7.0A, VDD = 50V, RG = 25Ω , Starting TJ = 25°C

3.ISD ≤ 7A, di/dt ≤ 200A/us, VDD ≤ BVDSS, Starting TJ = 25°C

4.Pulse Test : Pulse Width ≤ 300us, Duty Cycle ≤ 2%

5.Essentially independent of operating temperature.

Characteristics Curves

Figure 1. On-Region Characteristics	Figure2.Transfer Characteristics

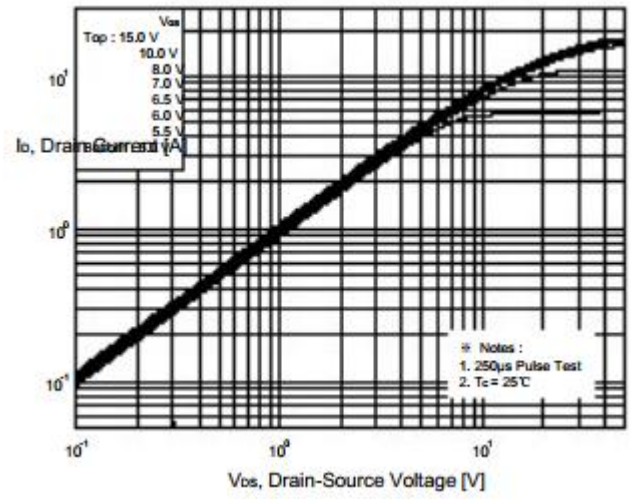
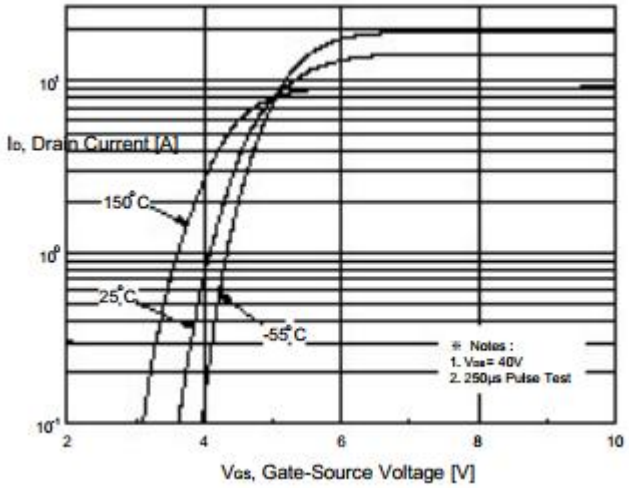

	

Figure3.On-Resistance Variation vs Drain Current and Gate Voltage	**Figure4.Body Diode Forward Voltage Variation with Source Current and Temperature**

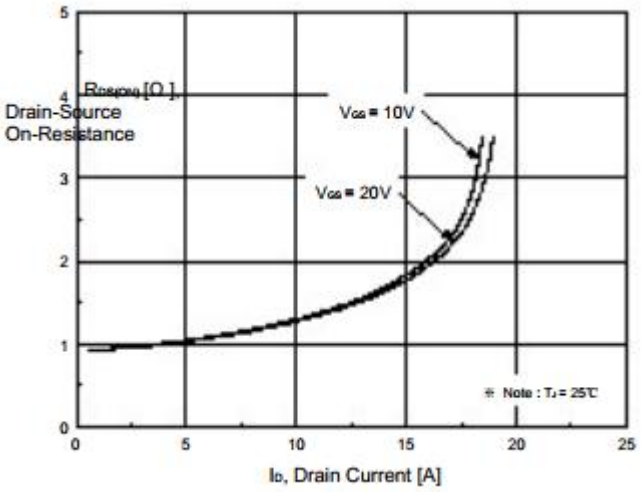
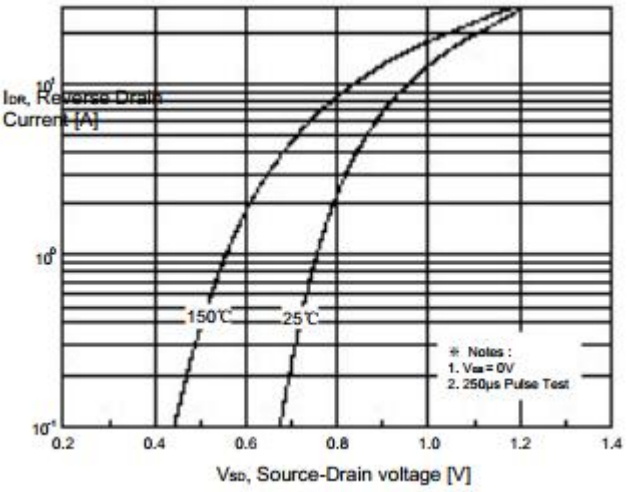

	

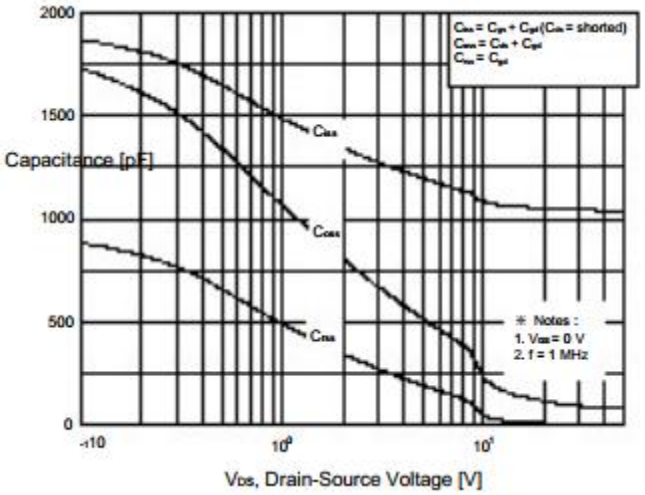
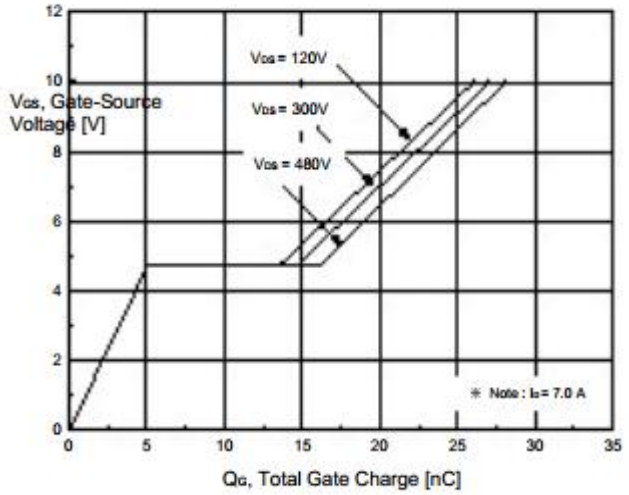
Figure5.Capacitance Characteristics	**Figure6.Gate Charge Characteristics**
	

Figure7.Breakdown Voltage Variation

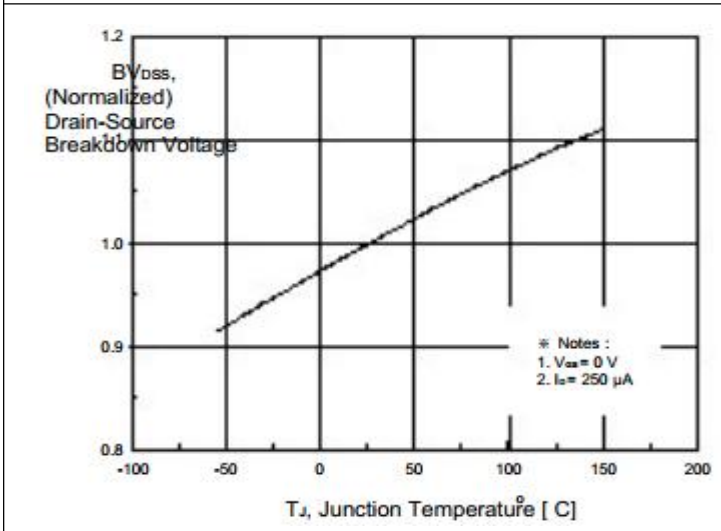


Figure8.On-Resistance Variation

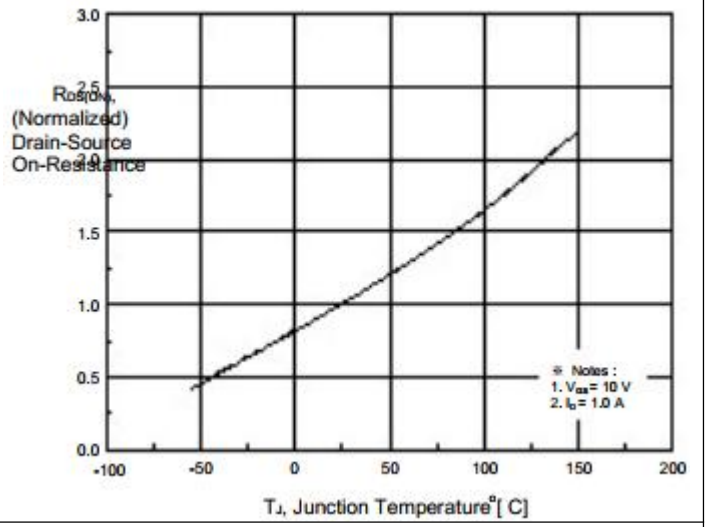


Figure9.Maximum Safe Operating Area

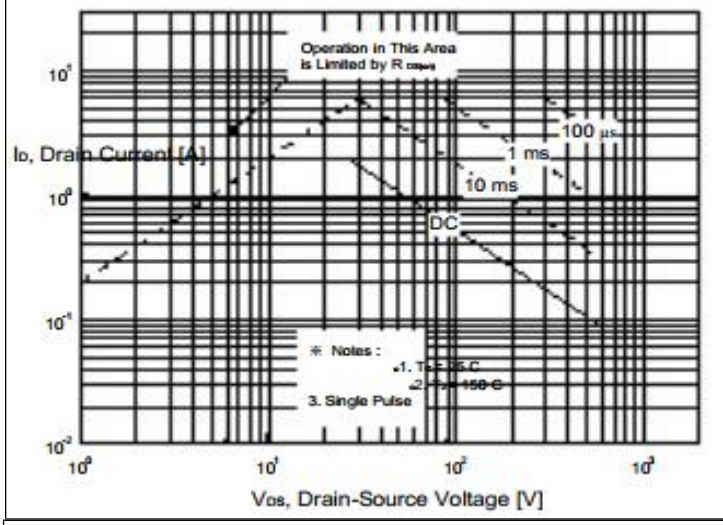


Figure 10. Maximum Drain Current vs Case Temperature

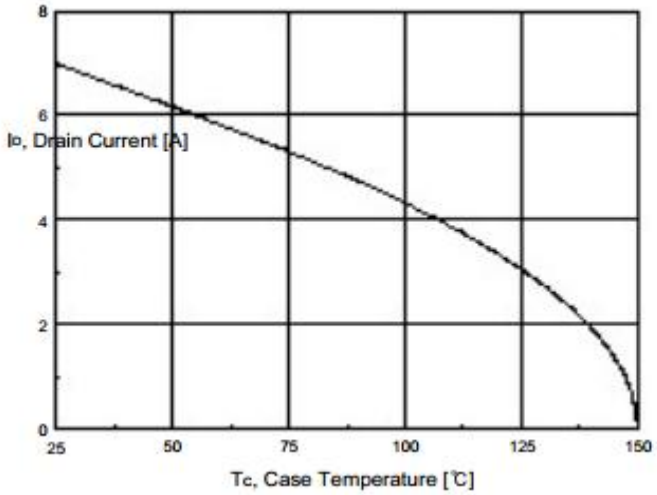
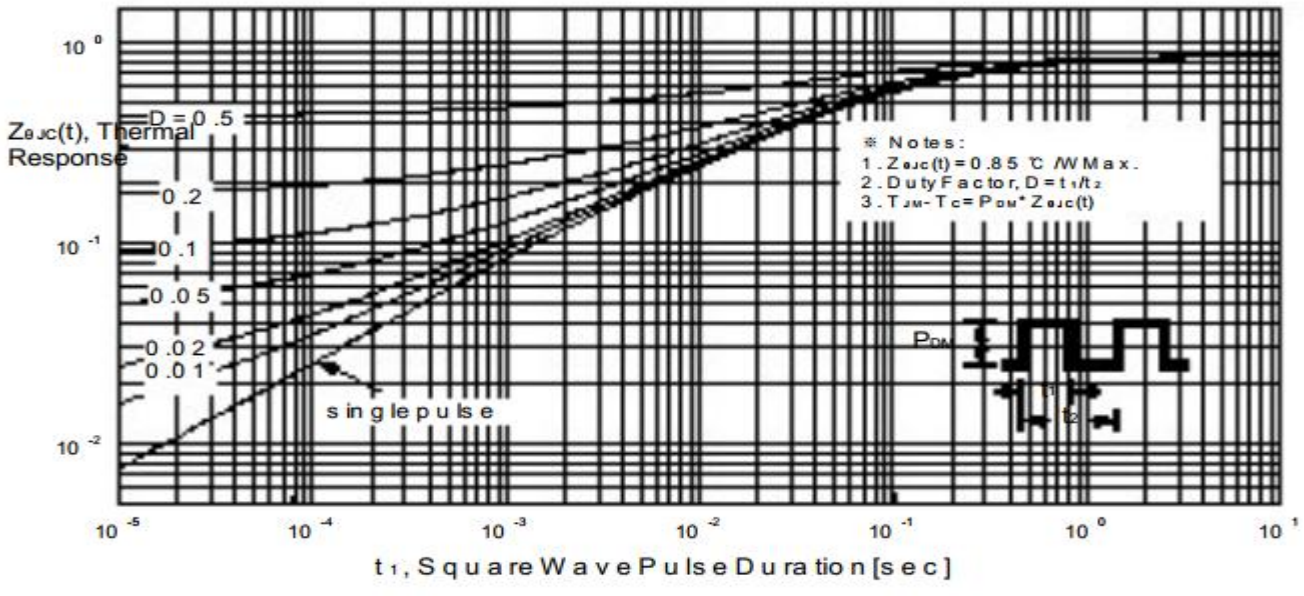
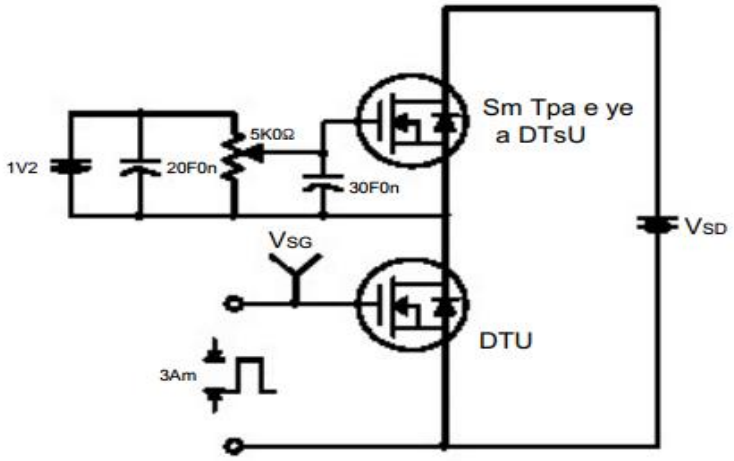
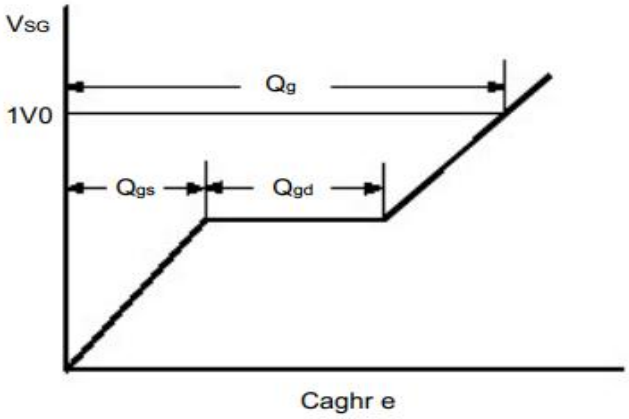


Figure11.TransientThermalResponseCurve

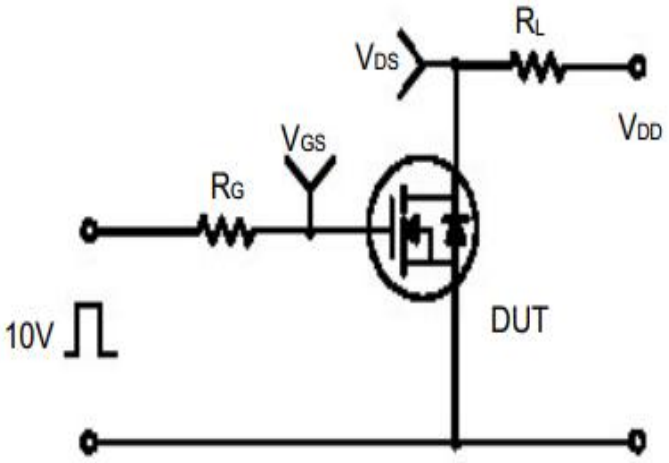


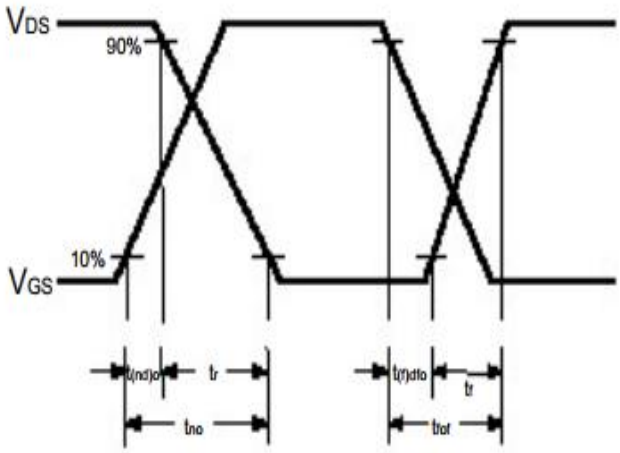
Gate Charge Test Circuit & Waveform



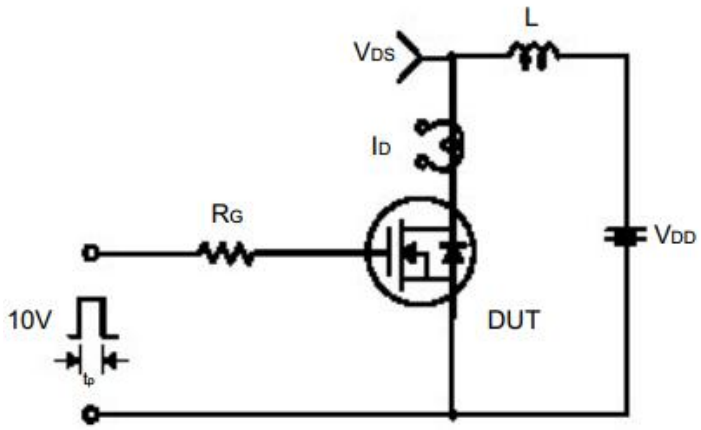


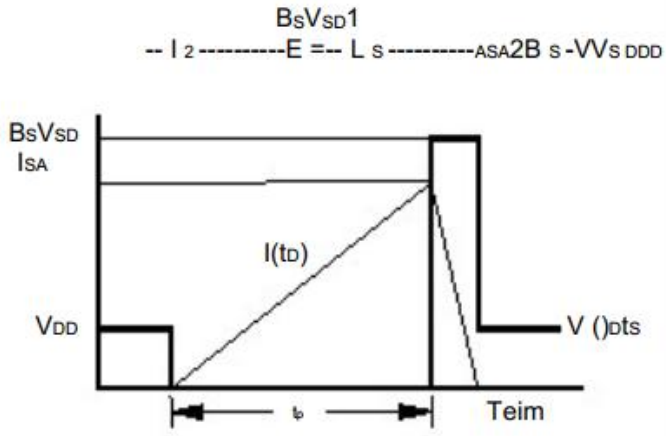
Resistive Switching Test Circuit & Waveforms



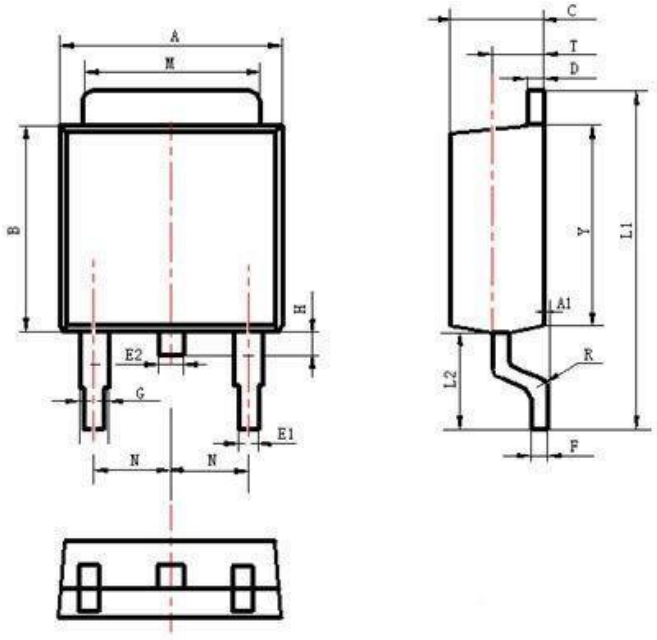


Unclamped Inductive Switching Test Circuit & Waveforms





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:

深圳市迈诺斯科技有限公司（总部）

地址：深圳市福田区华富街道田面社区深南中路4026号田面城市大厦22B-22C

邮编：518025

电话：0755-83273777

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