

100V N-Channel MOSFET

Description

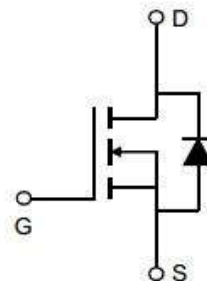
IRF3710STR, the silicon N-channel Enhanced MOSFETs, is obtained by advanced MOSFET technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor is suitable device for SMPS, high speed switching and general purpose applications.

FEATURES

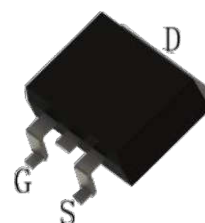
- ① $V_{DS}=100V, I_D=70A$ $R_{DS(ON)}<21m\Omega@V_{GS}=10V$
- ② Fast switching
- ③ 100% avalanche tested
- ④ Improved dv/dt capability

APPLICATIONS

- ① Switch Mode Power Supply(SMPS)
- ② Uninterruptible Power Supply(UPS)
- ③ Power Factor Correction(PFC)



Schematic diagram



TO-263

Package Marking And Ordering Information:

Ordering Codes	Package	Product Code	Packing
IRF3710STR	TO-263	IRF3710STR	Reel

Absolute Maximum Ratings $T_C = 25^\circ C$, unless otherwise noted			
Parameter	Symbol	Value	Unit
		TO-263	
Drain-Source Voltage ($V_{GS} = 0V$)	V_{DSS}	100	V
Continuous Drain Current	I_D	70	A
Pulsed Drain Current (note1)	I_{DM}	Figure 6	A
Gate-Source Voltage	V_{GSS}	± 20	V
Single Pulse Avalanche Energy (note2)	E_{AS}	1943	mJ
Avalanche Current (note1)	I_{AR}	32	A
Repetitive Avalanche Energy (note1)	E_{AR}	36	mJ
Power Dissipation ($T_C = 25^\circ C$)	P_D	200	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 175	$^\circ C$

Thermal Resistance			
Parameter	Symbol	Value	Unit
		TO-263	
Thermal Resistance, Junction-to-Case	R_{thJC}	0.75	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62	

Specifications TJ = 25℃, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	100	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 100V, V _{GS} = 0V, T _J = 25℃	--	--	1	μA
		V _{DS} = 80V, V _{GS} = 0V, T _J = 125℃	--	--	100	
Gate-Source Leakage	I _{GSS}	V _{GS} = +20V, V _{DS} =0V	--	--	100	nA
		V _{GS} =-20V, V _{DS} =0V	--	--	-100	
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2.0	--	4.0	V
Drain-Source On-Resistance (Note3)	R _{DS(on)}	V _{GS} = 10V, I _D = 28A	--	17	21	mΩ
Forward Transconductance	g _{fs}	V _{DS} = 10V, I _D = 28A		85		S
Dynamic						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 25V, f = 1.0MHz	--	2700	--	pF
Output Capacitance	C _{oss}		--	610	--	
Reverse Transfer Capacitance	C _{rss}		--	260	--	
Total Gate Charge	Q _g	V _{DD} =50V, I _D = 28A, V _{GS} = 0 to 10V	--	60	--	nC
Gate-Source Charge	Q _{gs}		--	15	--	
Gate-Drain Charge	Q _{gd}		--	45	--	
Turn-on Delay Time	t _{d(on)}	V _{DD} = 50V, I _D =28A, V _{GS} = 10V R _G = 2.5 Ω	--	20	--	ns
Turn-on Rise Time	t _r		--	28	--	
Turn-off Delay Time	t _{d(off)}		--	65	--	
Turn-off Fall Time	t _f		--	15	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I _S	T _C = 25℃	--	--	70	A
Pulsed Diode Forward Current	I _{SM}		--	--	230	
Body Diode Voltage	V _{SD}	T _J = 25℃, I _{SD} = 28A, V _{GS} = 0V	--	--	1.5	V
Reverse Recovery Time	t _{rr}	V _{GS} = 0V, I _S = 28A, diF/dt =100A /μs	--	195	--	ns
Reverse Recovery Charge	Q _{rr}		--	107	--	μC

Notes

- 1.Repetitive Rating: Pulse width limited by maximum junction temperature
2. $I_{AS}= 30A$, $V_{DD}= 50V$, $R_G= 25\ \Omega$, Starting $T_J= 25^{\circ}C$
- 3.Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 1\%$

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

Figure 1. Maximum Effective Thermal Impedance, Junction-to-Case

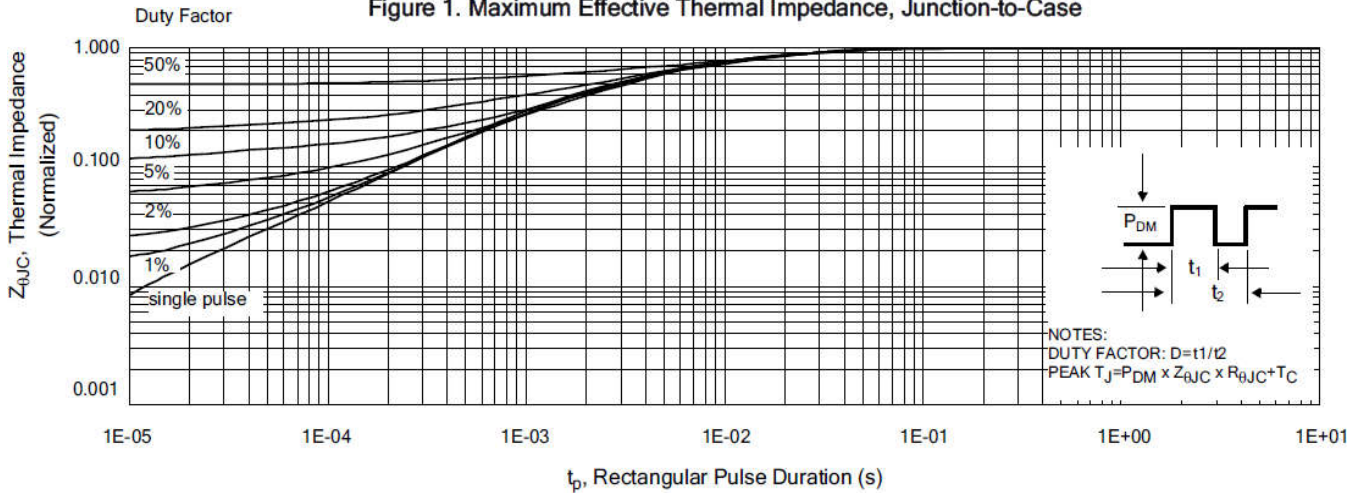


Figure 2. Maximum Power Dissipation vs Case Temperature

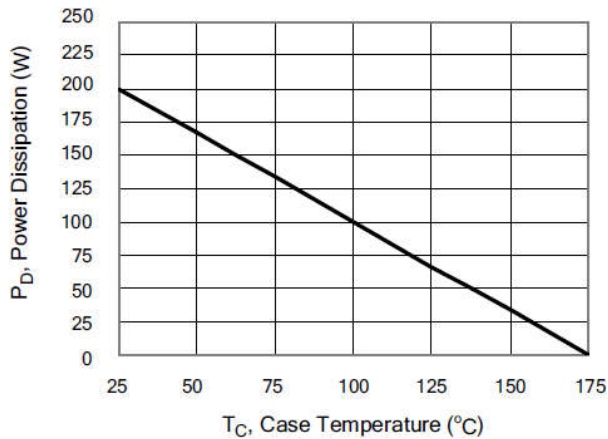


Figure 3. Maximum Continuous Drain Current vs Case Temperature

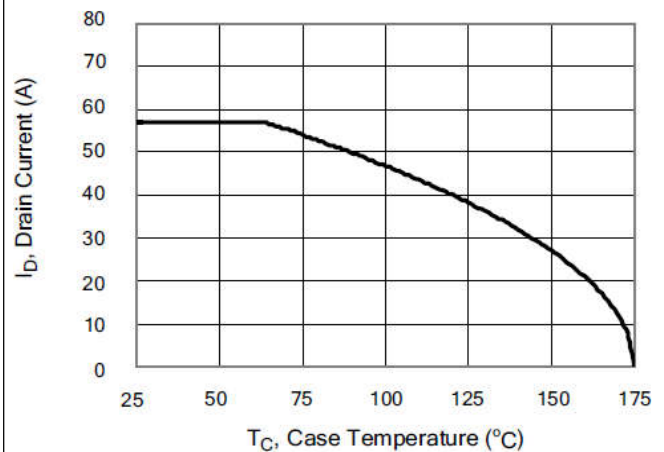


Figure 4. Typical Output Characteristics

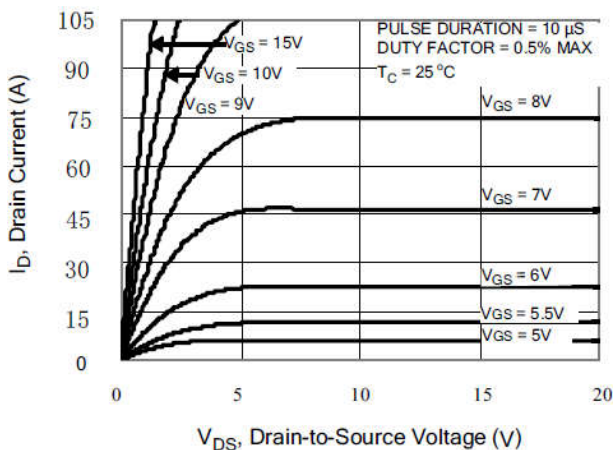
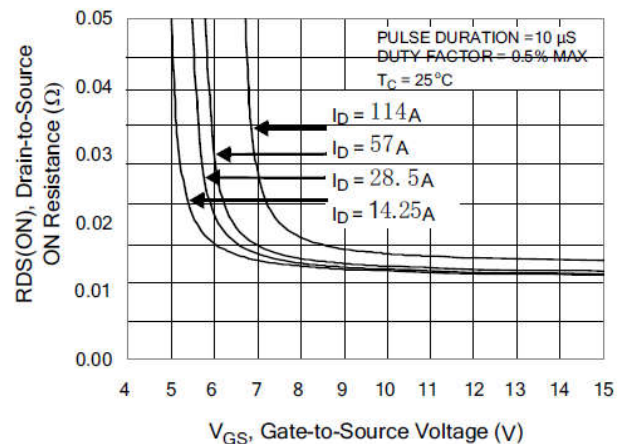


Figure 5. Typical Drain-to-Source ON Resistance vs Gate Voltage and Drain Current



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

Figure 6. Maximum Peak Current Capability

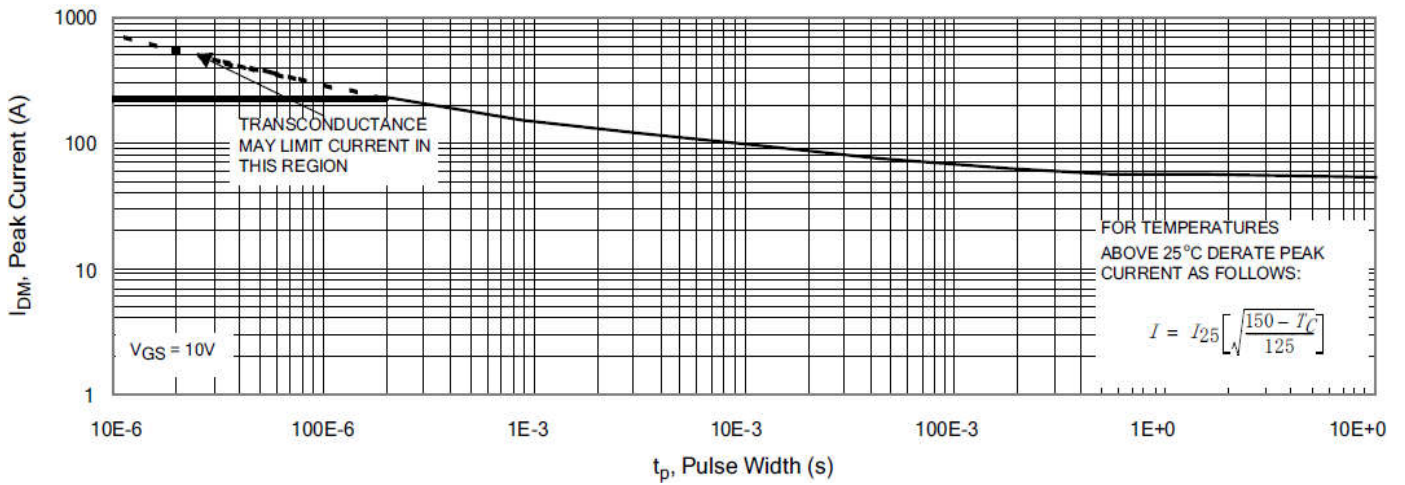


Figure 7. Typical Transfer Characteristics

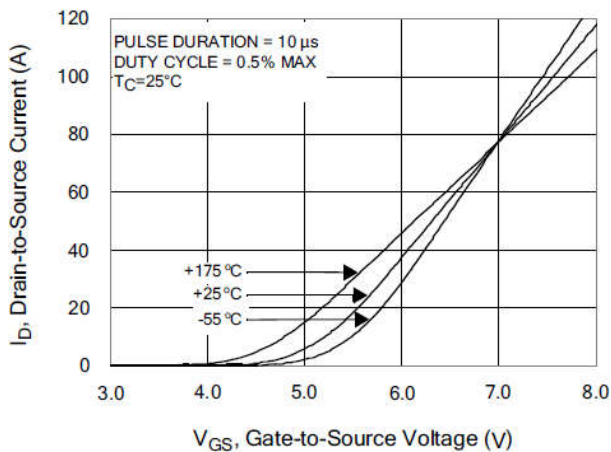


Figure 8. Unclamped Inductive Switching Capability

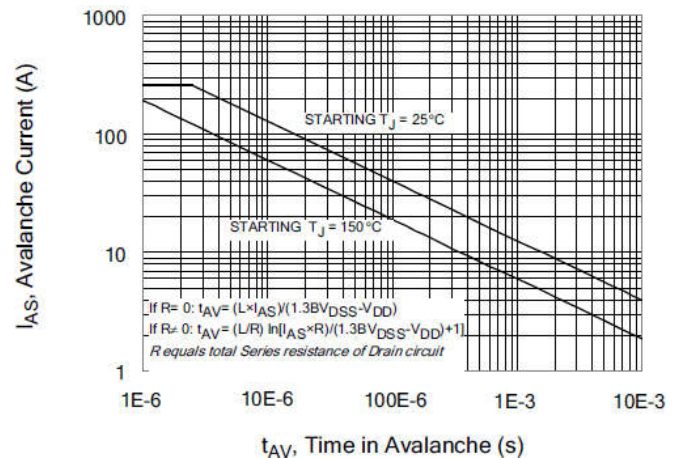


Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current

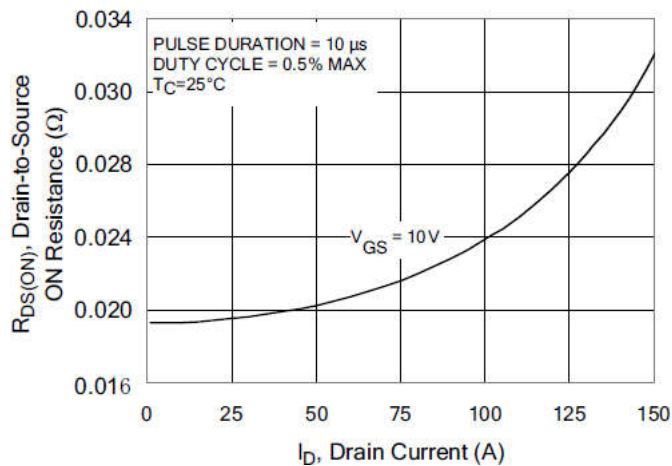
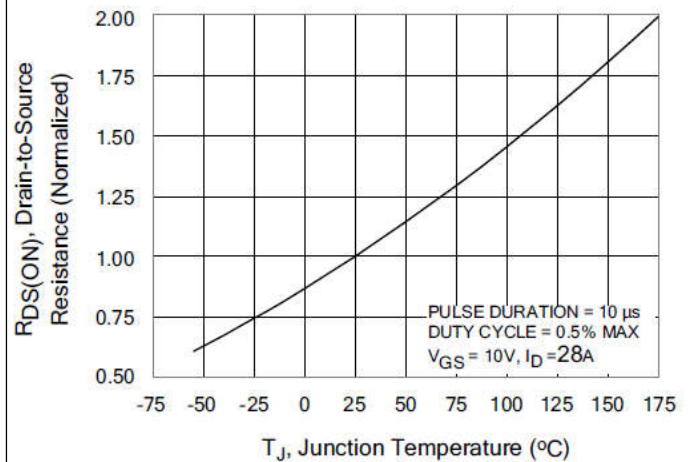


Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature



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

Figure 11. Typical Breakdown Voltage vs Junction Temperature

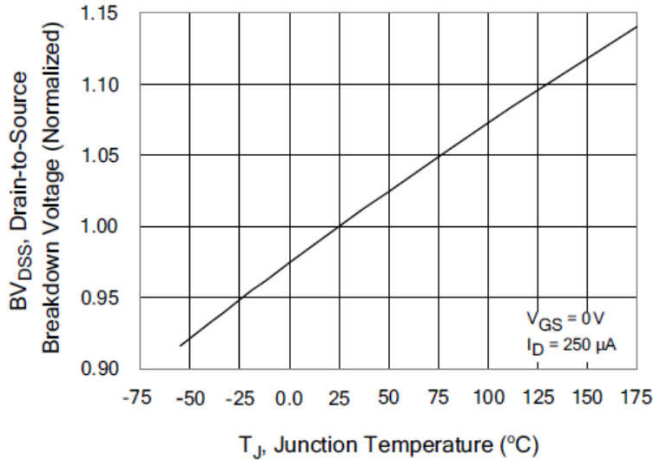


Figure 12. Typical Threshold Voltage vs Junction Temperature

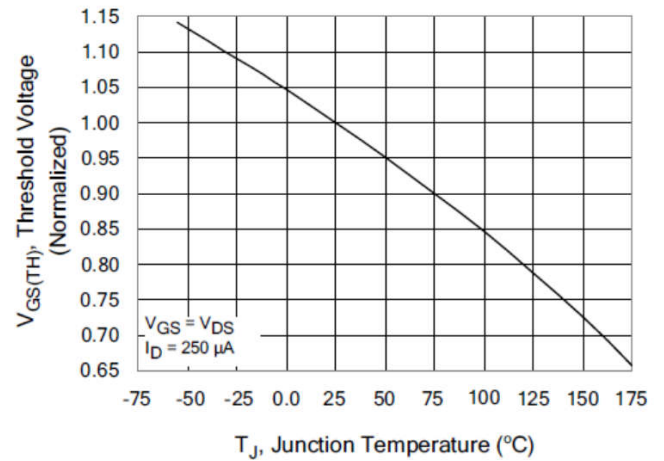


Figure 13. Maximum Forward Bias Safe Operating Area

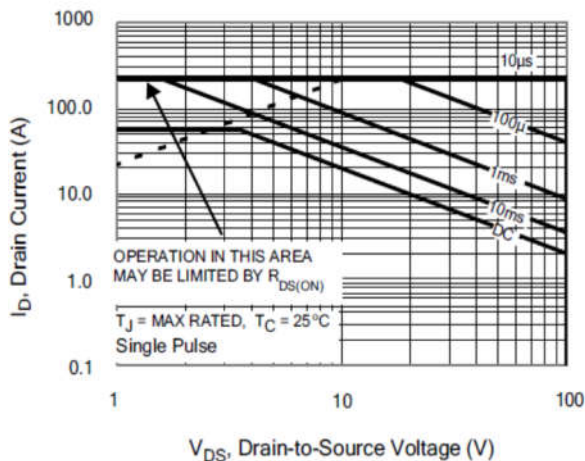


Figure 14. Capacitance vs Vds

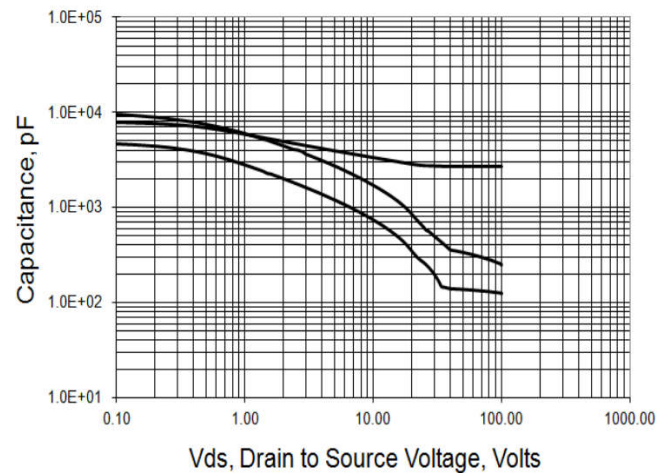


Figure 15. Typical Gate Charge

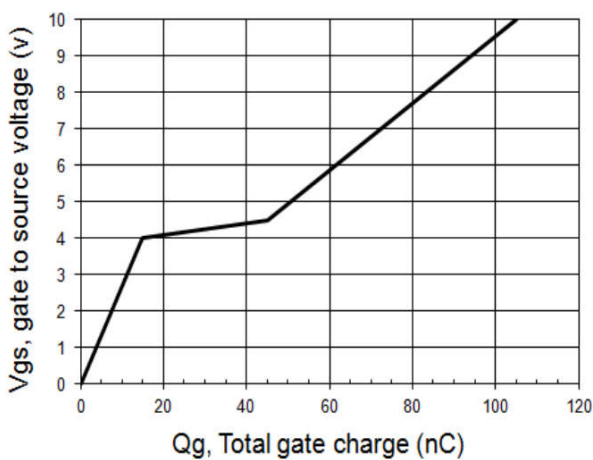


Figure 16. Typical Body Diode Transfer Characteristics

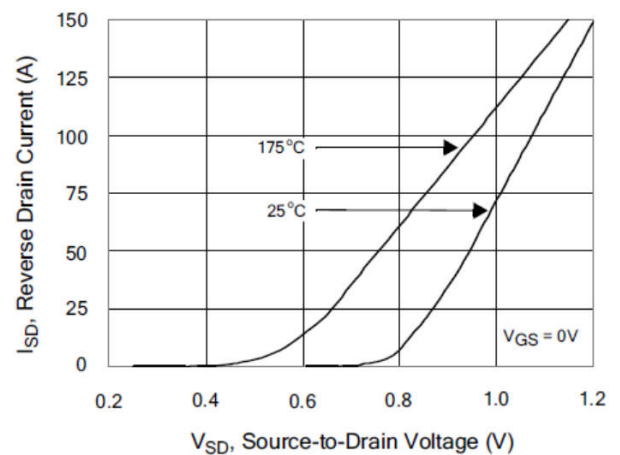


Figure A: Gate Charge Test Circuit and Waveform

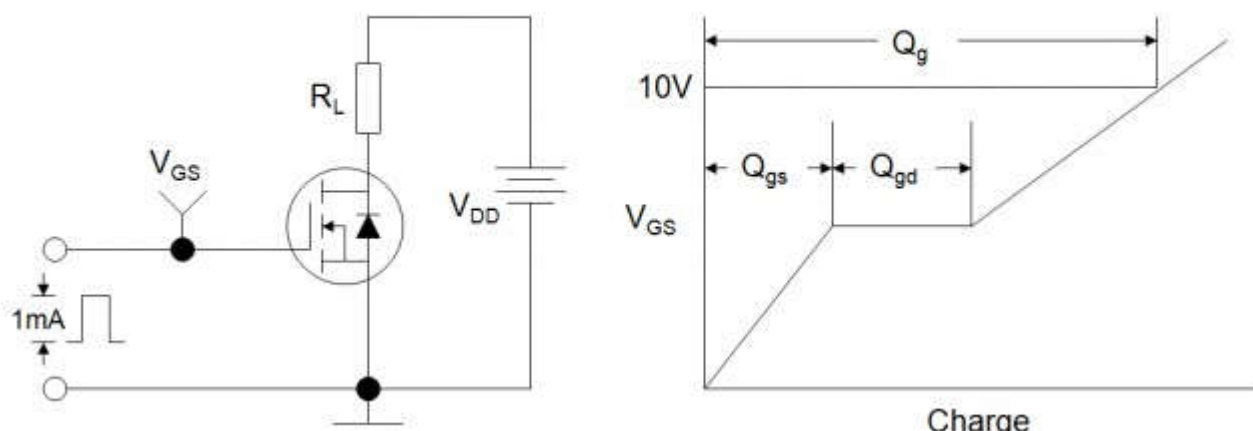


Figure B: Resistive Switching Test Circuit and Waveform

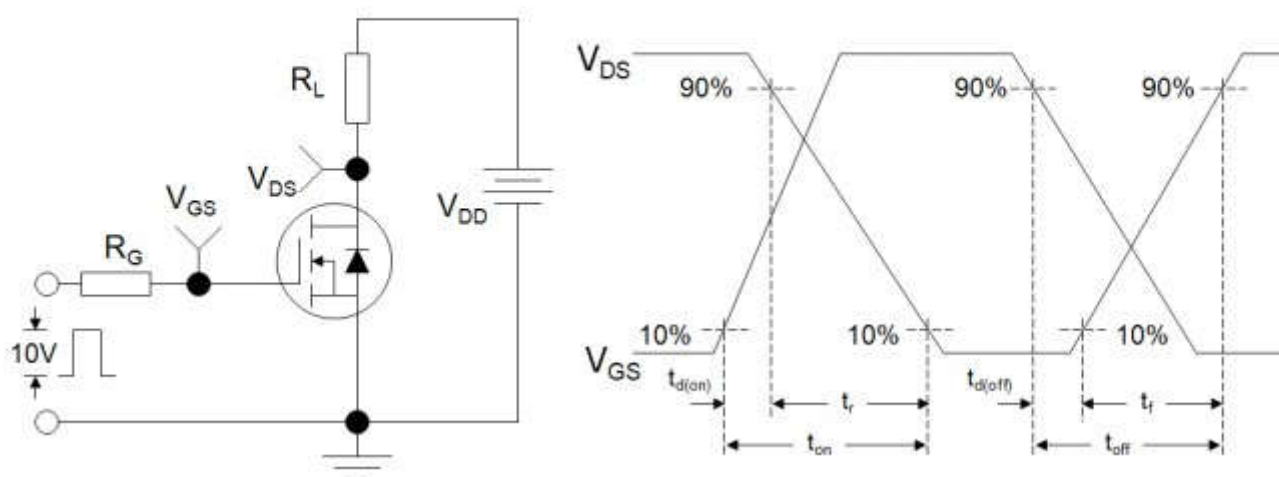
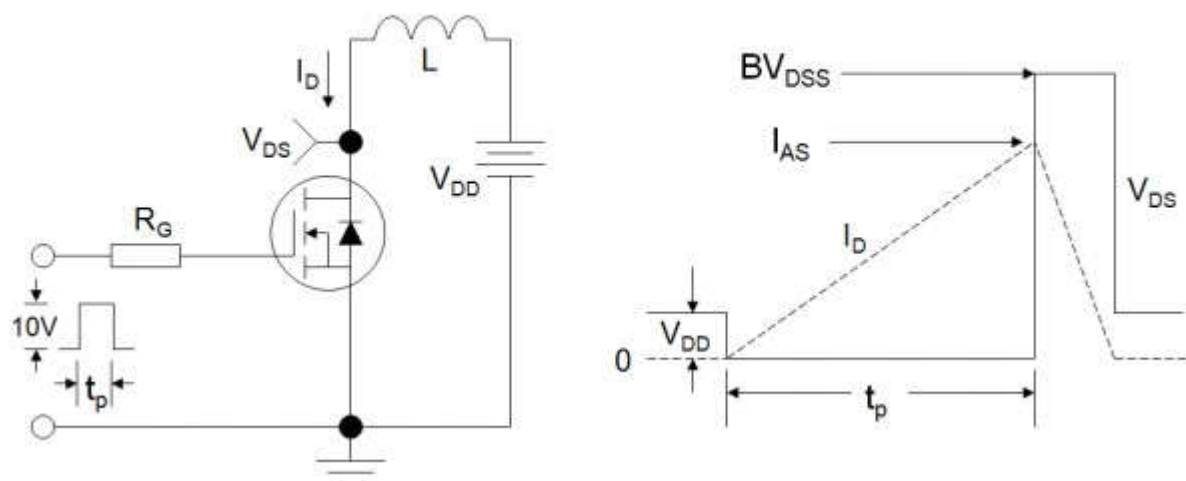
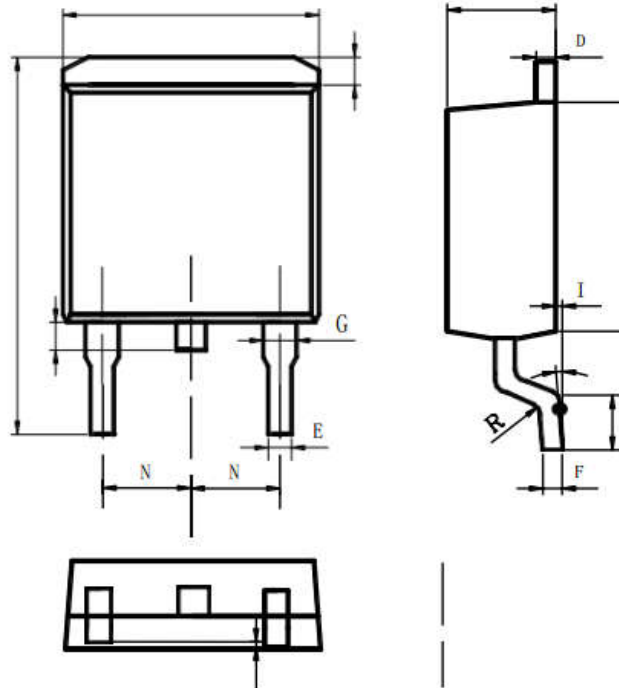


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



Package Description



Items	Values(mm)	
	MIN	MAX
A	9.60	10.6
B	15.0	16.0
B1	8.90	9.50
C	4.30	4.80
C1	2.30	3.10
D	1.20	1.40
E	0.70	0.90
F	0.30	0.60
G	1.17	1.37
H	2.70	3.80
L	12.6	14.8
N	2.34	2.74
Q	2.40	3.00
ΦP	3.50	3.90

TO-263 package



迈诺斯科技

IRF3710STR

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 without prior 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