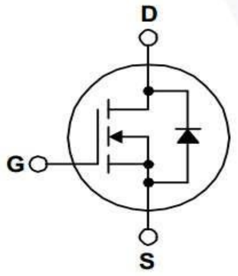
Description

MLS65R380P, the silicon N-channel Enhanced MOSFETs, is obtained by advanced Super Junction technology which reduce the conduction loss, improve switching performance. The transistor is suitable device for SMPS,high speed switching and general purpose applications.



KEY CHARACTERISTICS

① V_{DS}=650V,I_D=11A $R_{DS(ON)}$<0.33mΩ@V_{GS}=10V

FEATURES

① Fast Switching
② 100% avalanche tested
③ Improved dv/dt capability

APPLICATIONS

①High frequency switching mode power supply

Package Marking And Ordering Information：

Ordering Codes	Package	Product Code	Packing
MLS65R380P	TO-220F	M65R380P	Tube

Electrical Characteristics @ Ta=25℃ (unless otherwise specified)

Limited Parameters:

Symbol	Parameter	Value	Units
V_{DSS}	Drain-to-Source Breakdown Voltage	650	V
I_D	Drain Current (continuous) at Tc=25℃	11	A
I_{DM}	Drain Current (pulsed)	33	A
V_{GS}	Gate to Source Voltage	±20	V
P_{tot}	Total Dissipation at Tc=25℃	31	W
T_j	Max. Operating Junction Temperature	150	℃
Eas	Single Pulse Avalanche Energy	250	mj

Electrical Parameters:

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{DS}	Drain-source Voltage	V_{GS} =0V, I_D=250μA	650			V
$R_{DS(on)}$	Static Drain-to-Source on-Resistance	VGS=10V,ID=3.8A		0.33	0.38	mΩ
$V_{GS(th)}$	Gated Threshold Voltage	V_{DS}=V_{GS}, $_D$=250μA	2		4	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=650V, V_{GS}= 0V			1.0	μA
$I_{GSS(F)}$	Gate-Source Forward Leakage	V_{GS} = +30V			100	nA
$I_{GSS(R)}$	Gate-Source Reverse Leakage	V_{GS} = -30V			-100	nA
C_{iss}	Input Capacitance	VGS = 0V VDS = 25 Vf = 1.0MHz		770		pF
C_{oss}	Output Capacitance			560		pF
C_{rss}	Reverse Transfer Capacitance			25		pF
Q_g	Total Gate Charge	ID =4.8A VDD =520V VGS = 10V		21.8		nC
Q_{gs}	Gate-Source Charge			4.5		nC
Q_{gd}	Gate-Drain Charge			8		nC

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$t_{d(on)}$	Turn-on Delay Time	ID =4.8A VDD =400V VGS =10 VRG=5Ω		11		nS
t_r	Turn-on Rise Time			9		nS
$t_{d(off)}$	Turn-off Delay Time			38		nS
t_f	Turn-off Fall Time			8		nS

Source-Drain Diode Characteristics

Symbol	Parameter	Test Conditions	Values			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)	TC=25 °C	--	--	11	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	33	A
V_{SD}	Diode Forward Voltage	IS=4.8A, VGS=0V(Note4)	--	--	0.9	V
T_{rr}	Reverse Recovery Time	IS=4.8A, Tj = 25°C dIF/dt=100A/us, VGS=0V	--	285	--	ns
Q_{rr}	Reverse Recovery Charge		--	3135	--	nC
I_{rrm}	Reverse Recovery Current		--	22	--	A

Characteristics Curves

Figure 1a Safe Operating Area (No FullPAK)

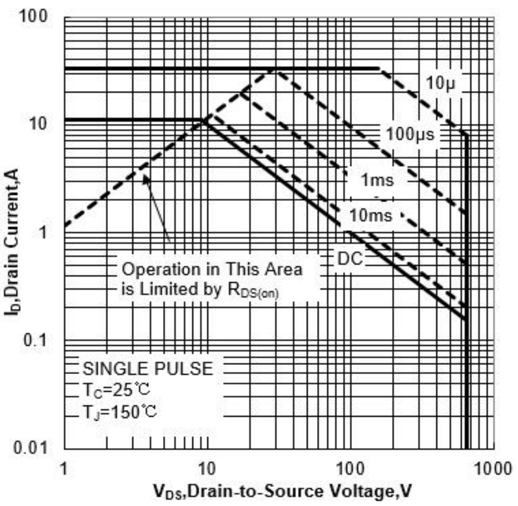


Figure 1b Safe Operating Area (FullPAK)

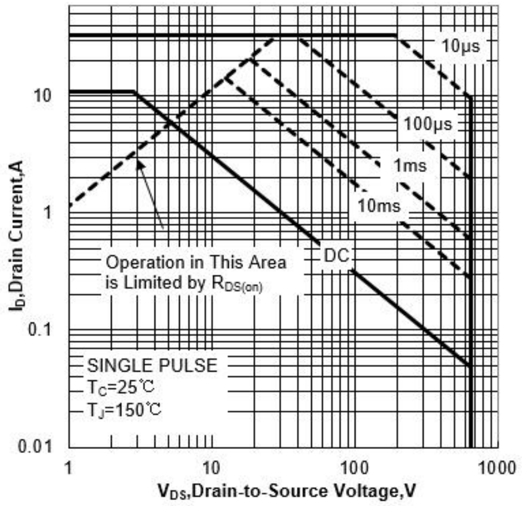


Figure 2a Power Dissipation (No FullPAK)

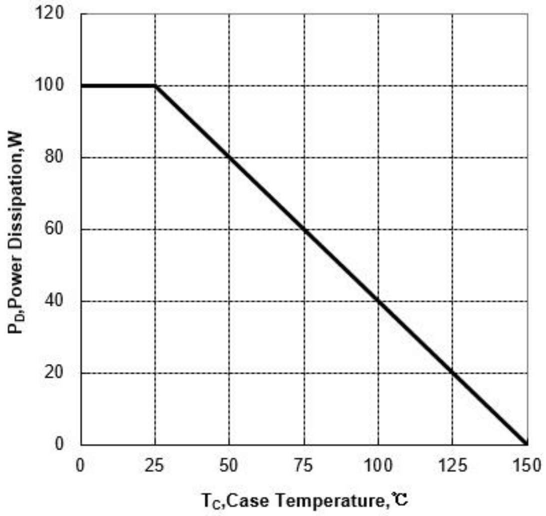


Figure 2b Power Dissipation (FullPAK)

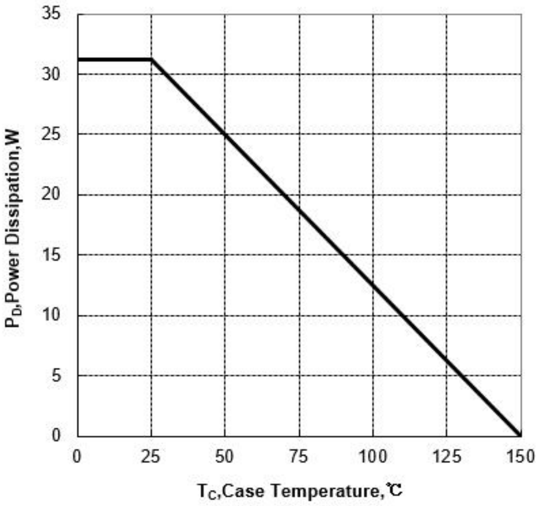


Figure 6 Typical Drain to Source ON Resistance vs Drain Current

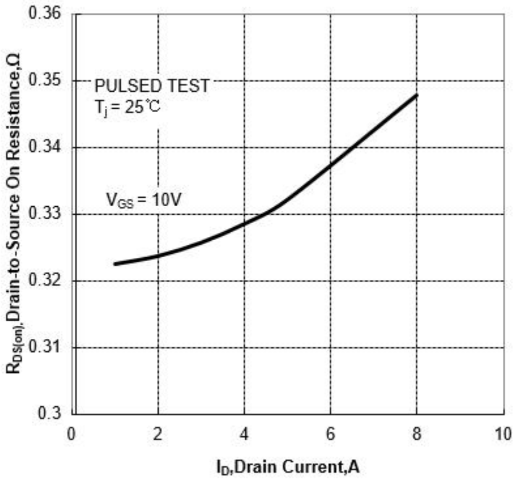


Figure 7 Typical Drian to Source on Resistance vs Junction Temperature

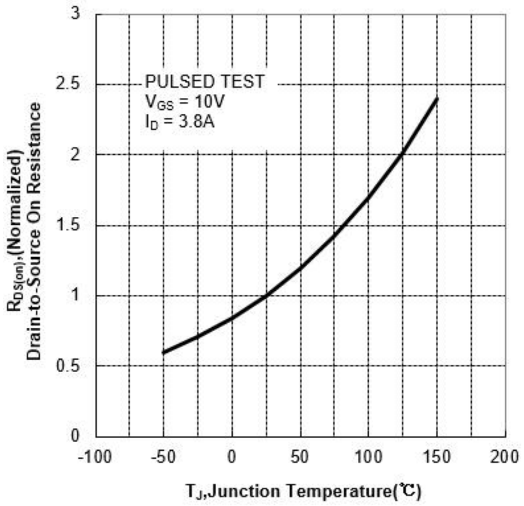


Figure 8 Typical Theshold Voltage vs Junction Temperature

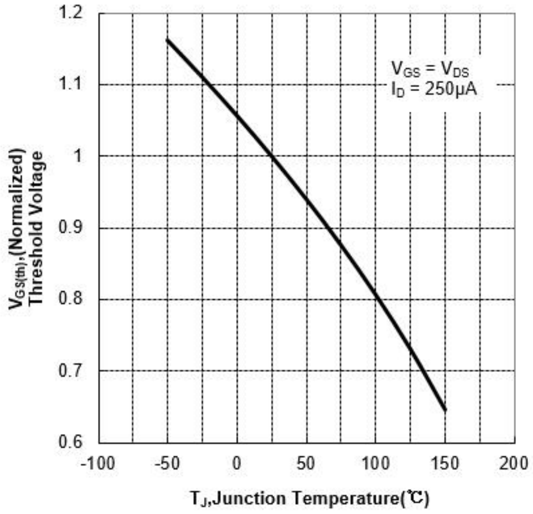


Figure 9 Typical Breakdown Voltage vs Junction Temperature

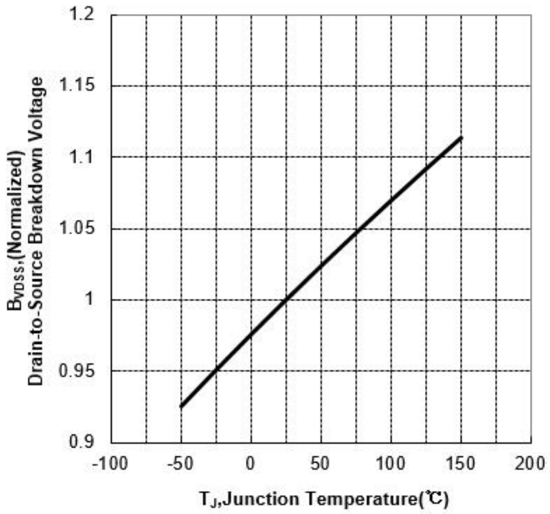


Figure 10 Typical Theshold Voltage vs Junction Temperature

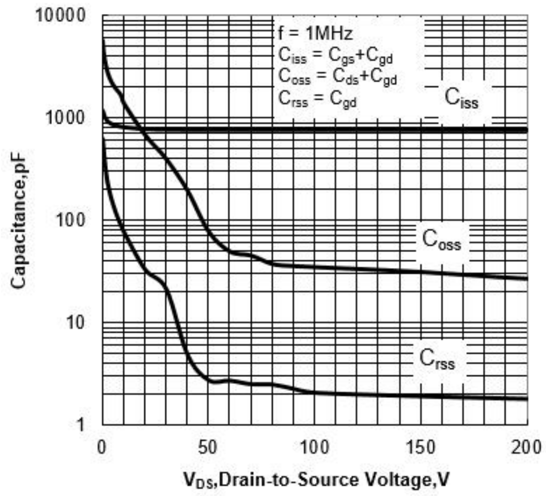
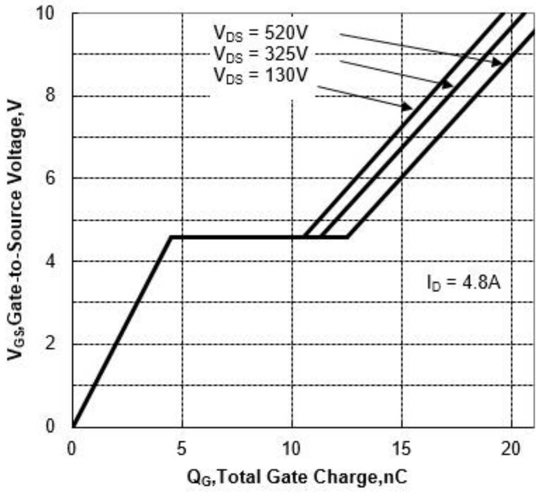


Figure 11 Typical Breakdown Voltage vs Junction Temperature



Test Circuit and Waveform

Figure 12 Gate Charge Test Circuit

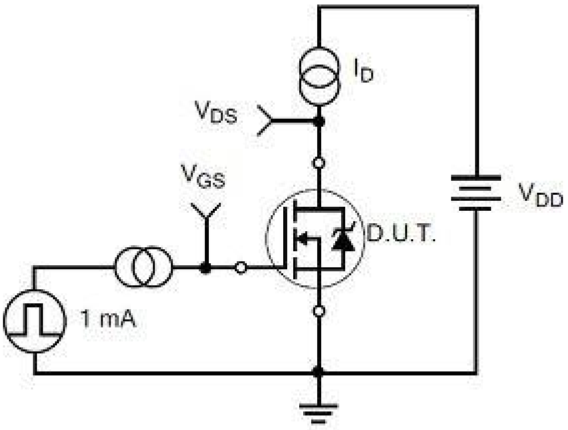


Figure 13 Gate Charge Waveforms

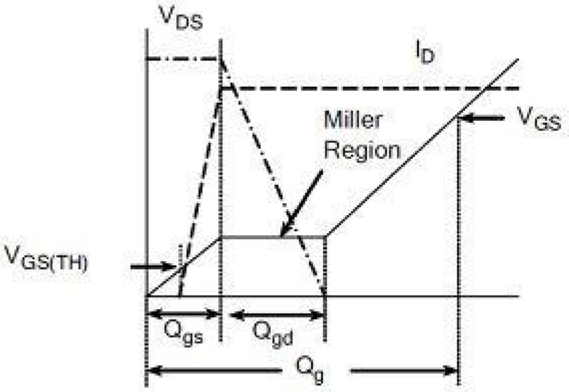


Figure 14 Resistive Switching Test Circuit

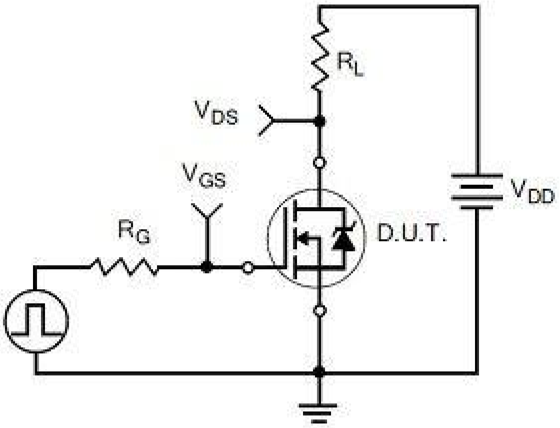


Figure 15 Resistive Switching Waveforms

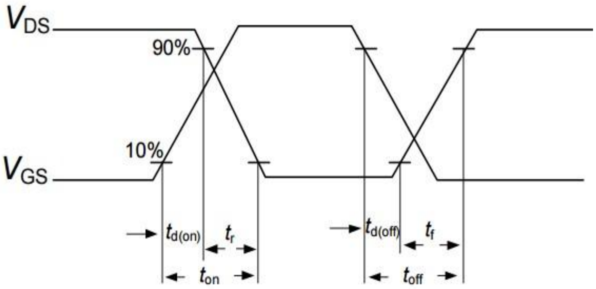


Figure 16 Diode Reverse Recovery Test Circuit

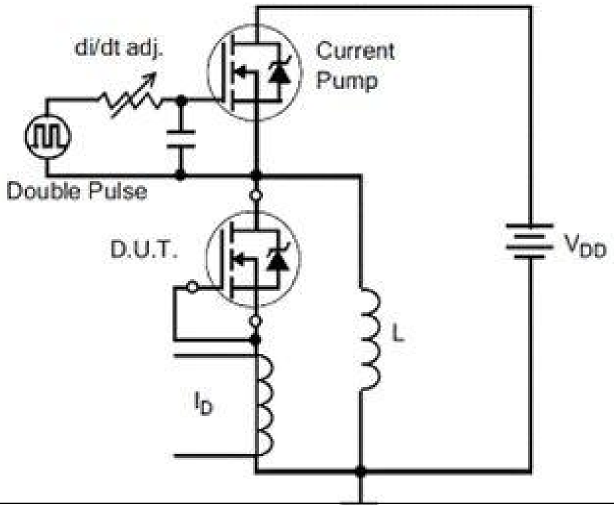


Figure 17 Diode Reverse Recovery Waveform

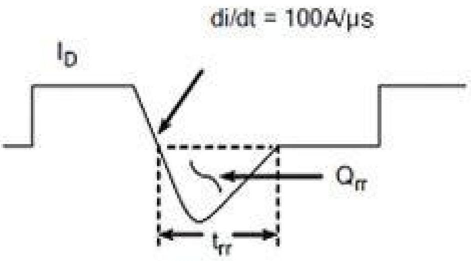
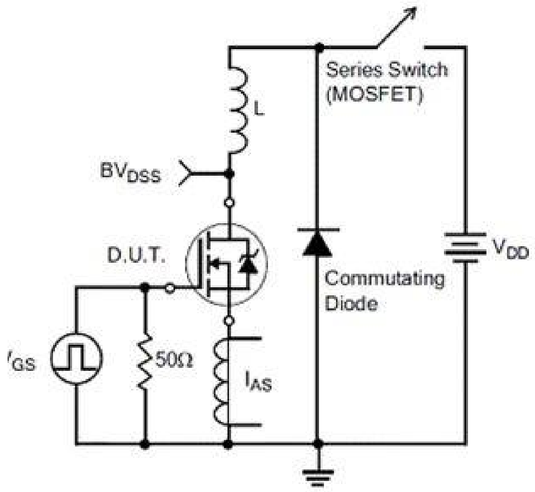
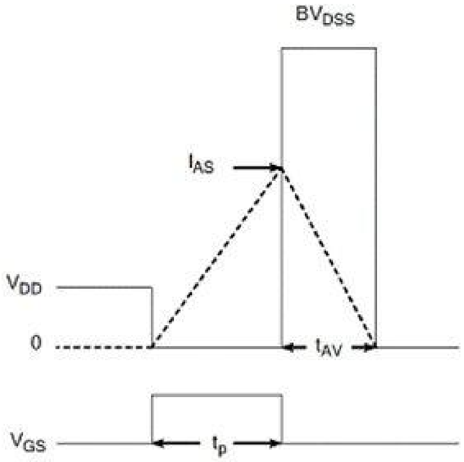
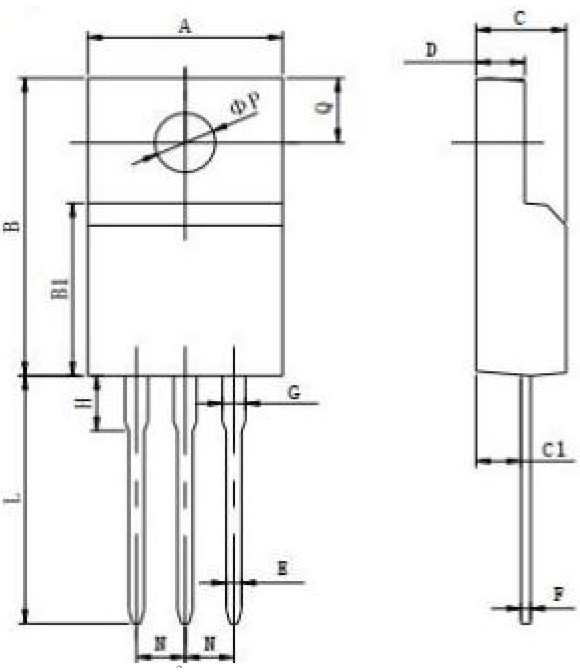


Figure 18 Unclamped Inductive Switching Test Circuit	Figure 19 Unclamped Inductive Switching Waveform
 	

Package Description



Items	Values(mm)	
	MIN	MAX
A	9.60	10.4
B	15.4	16.2
B1	8.90	9.50
C	4.30	4.90
C1	2.10	3.00
D	2.40	3.00
E	0.60	1.00
F	0.30	0.60
G	1.12	1.42
H	3.40	3.80
	1.60	2.90
L	12.0	14.0
N	2.34	2.74
Q	3.15	3.55
ϕp	2.90	3.30

TO-220F 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.

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