EVVOSEMI®

THINK CHANGE DO

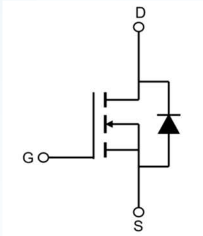
ESD TVS MOS LDO Diode Sensor DC-DC

Product Specification

Domestic Part Number	IRF1010ES
Overseas Part Number	IRF1010ES
Equivalent Part Number	IRF1010ES

Feature

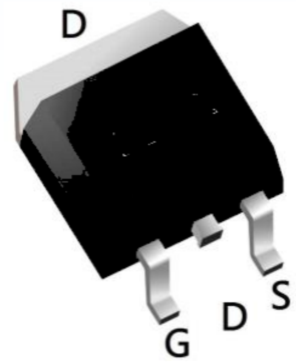
- 60V,80A
  $R_{DS(ON)}$ <10mΩ @V_{GS}=10V
  $R_{DS(ON)}$ <14mΩ @V_{GS}=4.5V
- Advanced Trench Technology
- Lead free product is acquired
- Excellent $R_{DS(ON)}$ and Low Gate Charge



Schematic Diagram

Application

- PWM applications
- Load Switch
- Power management



ABSOLUTE MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current (T_a =25℃)	I_D	80	A
Continuous Drain Current (T_a =100℃)	I_D	56	A
Pulsed Drain Currenr (1)	I_{DM}	232	A
Singel Pulsed Avalanche Energy (2)	E_{AS}	110	mJ
Power Dissipation	P_D	70	W
Thermal Resistance from Junction to Case	$R_{θJC}$	2.14	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ +150	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	60	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =60V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage(3)	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1	1.7	2.5	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =10V, I_D =30A	-	7.5	10	mΩ
		V_{GS} =4.5V, I_D =20A	-	10	14	
Forward tranconductance(3)	g_{FS}	V_{DS} =10V, I_D =30A	20	-	-	S
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =25V, V_{GS} =0V, f =1MHz	-	4400	-	pF
Output Capacitance	C_{oss}		-	210	-	
Reverse Transfer Capacitance	C_{rss}		-	190	-	
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V, I_D=30A, R_L=1Ω V_{GS}=10V, R_G=3Ω	-	7.1	-	ns
Turn-on rise time	t_r		-	5.3	-	
Turn-off delay time	$t_{d(off)}$		-	27.2	-	
Turn-off fall time	t_f		-	6.2	-	
Total Gate Charge	Qg	VDS=30V, ID=30A, VGS=10V	-	77	-	nC
Gate-Source Charge	Qgs		-	9	-	
Gate-Drain Charge	Qgd		-	23	-	
Source-Drain Diode characteristics						
Diode Forward voltage(3)	V_{DS}	V_{GS} =0V, I_S=30A	-	-	1.2	V
Diode Forward current(4)	I_S		-	-	80	A
Body Diode Reverse Recovery Time	trr	T_J=25°, IF=30A,di/dt=100A/us		29		ns
Body Diode Reverse Recovery Charge	Qrr	T_J=25°, IF=30A,di/dt=100A/us		45		nc

Notes:

1. Repetitive Rating: pulse width limited by maximum junction temperature
2. EAS Condition:T_J=25℃,V_{DD}=20V,R_G=25Ω,L=0.5mH,I_{AS}=21A
3. Pulse Test: pulse width≤300μs, duty cycle≤2%
4. Surface Mounted on FR4 Board,t≤10 sec

Test Circuit

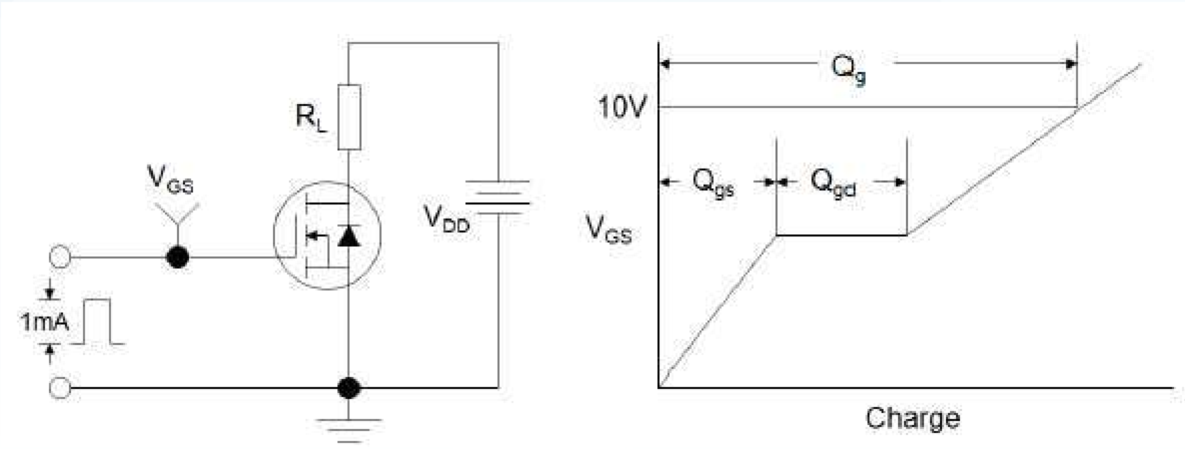


Figure1:Gate Charge Test Circuit & Waveform

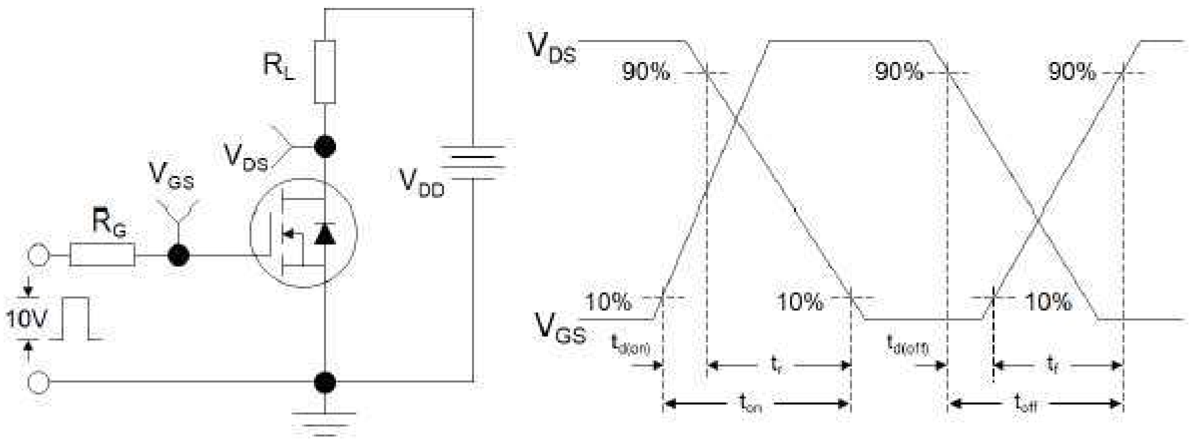


Figure 2: Resistive Switching Test Circuit & Waveforms

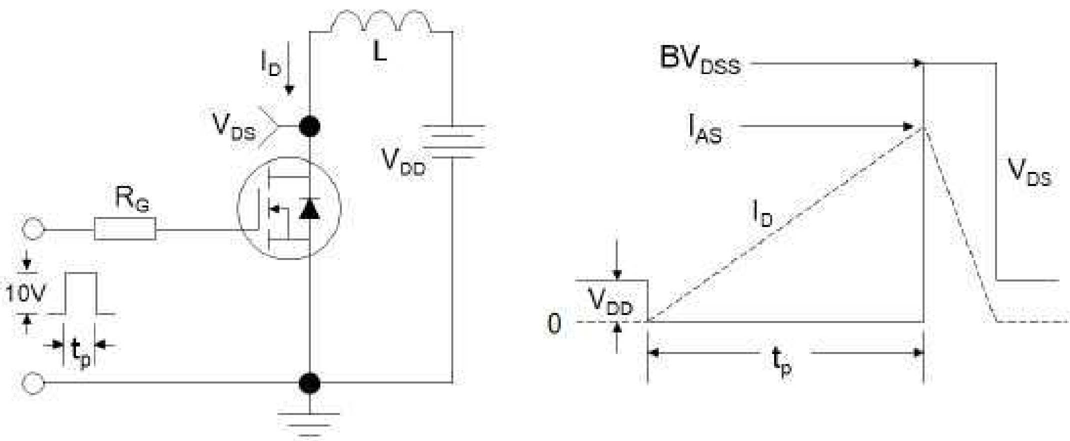


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

Figure1: Output Characteristics

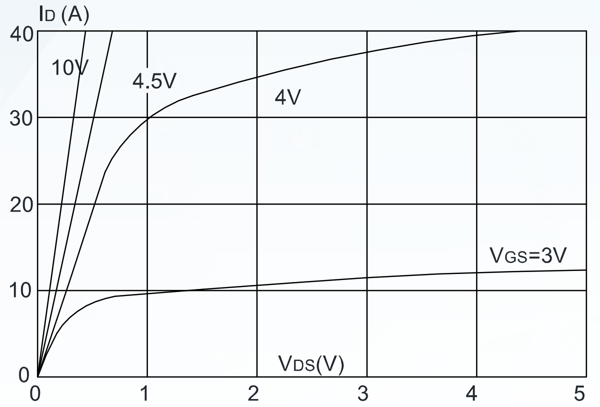


Figure 2: Typical Transfer Characteristics

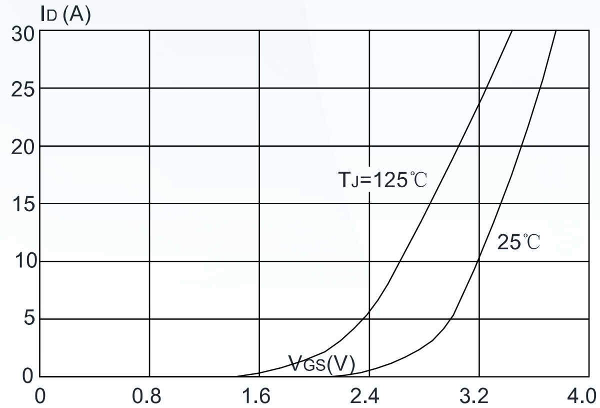


Figure 3: On-resistance vs. Drain Current

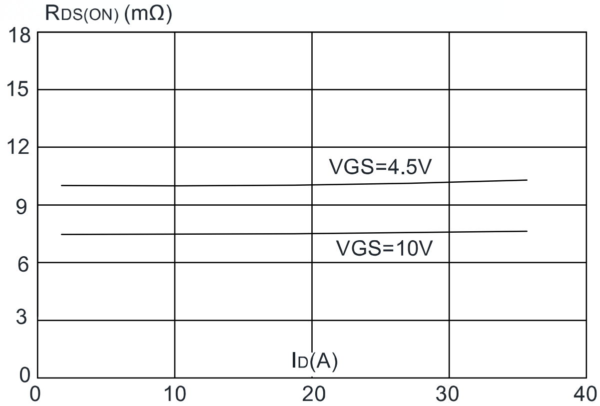


Figure 4: Body Diode Characteristics

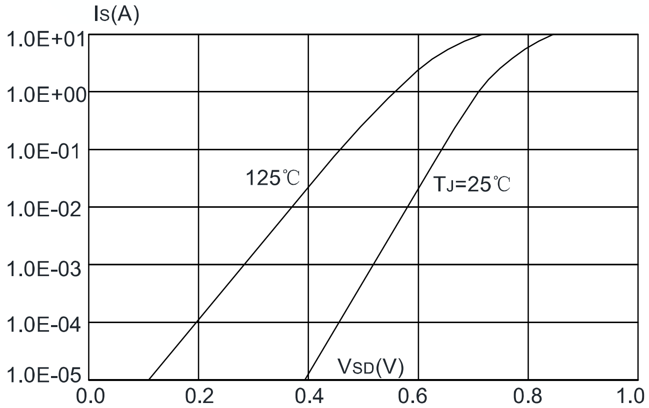


Figure 5: Gate Charge Characteristics

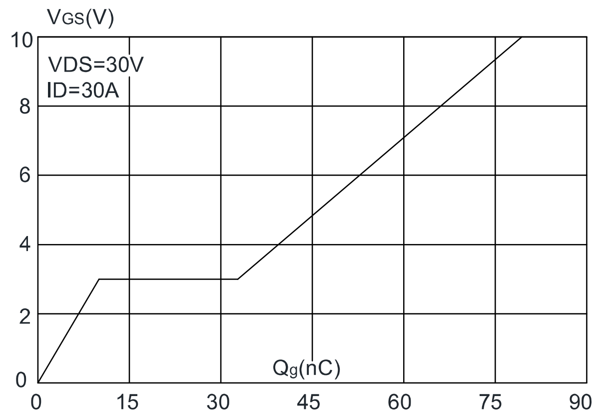


Figure 6: Capacitance Characteristics

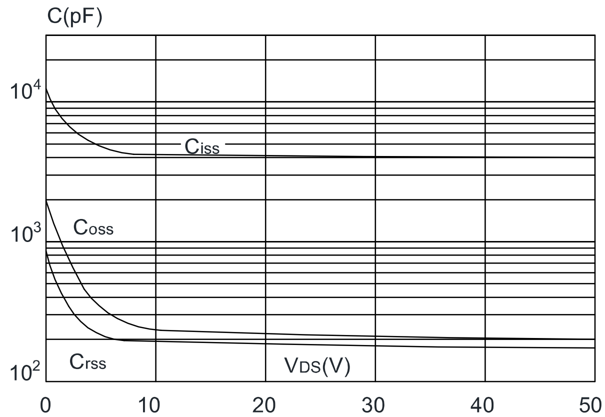


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

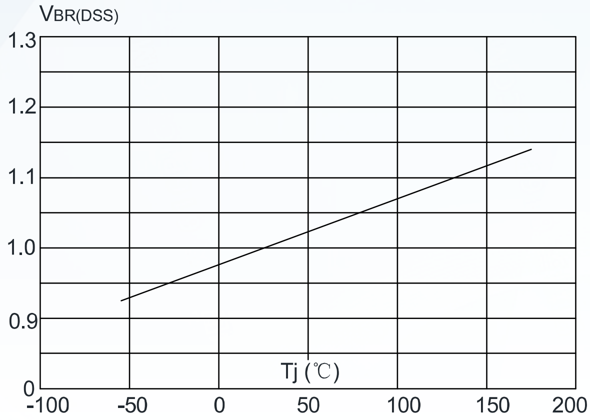


Figure 8: Normalized on Resistance vs. Junction Temperature

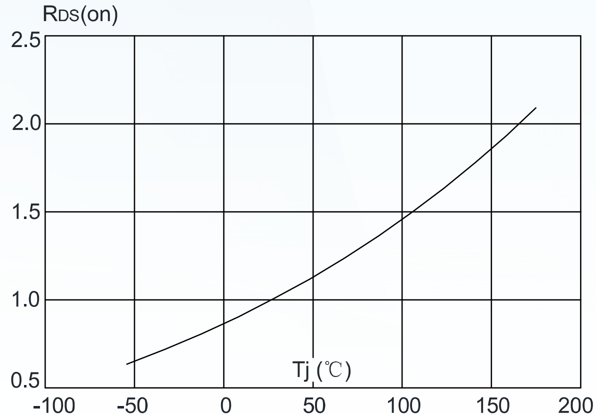


Figure 9: Maximum Safe Operating Area

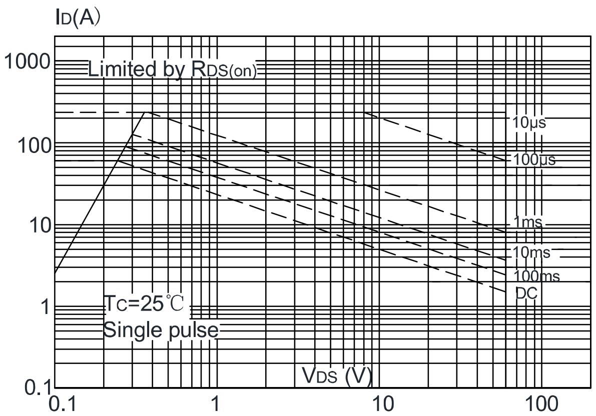


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

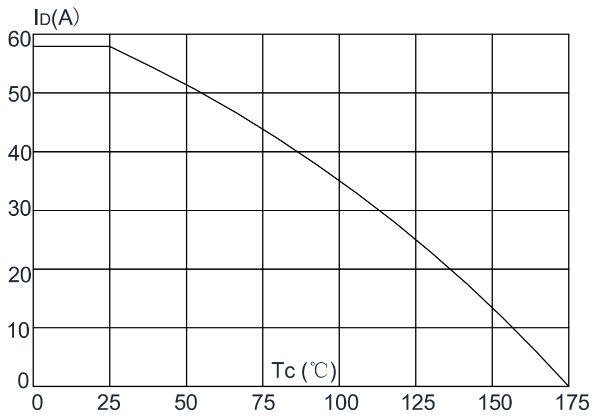
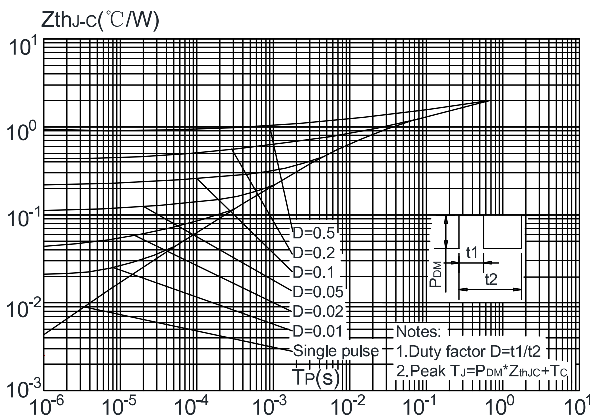


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



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