EVVOSEMI®

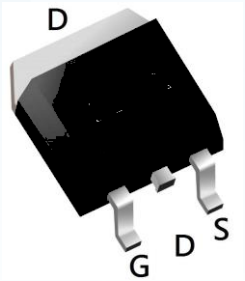
THINK CHANGE DO

ESD TVS MOS LDO Diode Sensor DC-DC

Product Specification

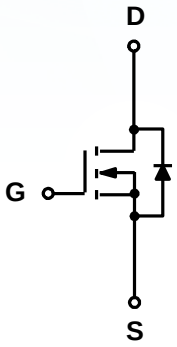
Domestic Part Number	IRFS4127
Overseas Part Number	IRFS4127
Equivalent Part Number	IRFS4127

TO263 Pin Configuration



Features

- 200V,70A
  $R_{DS(ON)}$ <27mΩ @V_{GS}=10V TYP:23 mΩ
- Surface-mounted package
- Advanced Process Technology
- Low QG for Fast Response
- High Repetitive Peak Current Capability for Reliable



Applications

- Short Fall & Rise Times for Fast Switching
- 175℃ Operating Junction Temperature for Improved Ruggedness
- Repetitive Avalanche Capability for Robustness and Reliability
- Class-D Audio Amplifier 300W-500W(Half-bridge)

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	200	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current	Tc=25℃	I_D	70	A
	Tc=100℃		48	A
Pulsed Drain Current		I_{DM}	280	A
Single Pulsed Avalanche Energy (V_{DD}=50V,L=0.5mH) (2)		E_{AS}	223	mJ
Drain Power Dissipation		P_D	263	W
Thermal Resistance from Junction to Case		$R_{\theta JC}$	0.57	℃/W
Thermal Resistance- Junction to Ambient		$R_{\theta JA}$	62.5	℃/W
Junction Temperature		T_J	175	℃
Storage Temperature		T_{STG}	-55~ +175	℃

MOSFET ELECTRICAL CHARACTERISTICS(T_J=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	200	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS} =200V, V_{GS} = 0V	-	-	1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V	-	-	±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	3.0	3.8	5.0	V
Drain-source on-resistance[a]	$R_{DS(on)}$	V_{GS} =10V, I_D =46A	-	23	27	mΩ
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =25V, V_{GS} =0V, f =1.0MHz	-	4460	-	pF
Output Capacitance	C_{oss}		-	470	-	
Reverse Transfer Capacitance	C_{rss}		-	160	-	
Gate Resistance	Rg	V_{GS}=0V, V_{DS} Open, f=1MHz		1.1		Ω
Switching characteristics						
Turn-on delay time	$t_{d(on)}$	V_{DD}=100V, I_D=46A, R_G=2.5Ω, V_G=10V	-	33	-	ns
Turn-on rise time	t_r		-	64	-	
Turn-off delay time	$t_{d(off)}$		-	45	-	
Turn-off fall time	t_f		-	22	-	
Total Gate Charge	Qg	V_{DS}=160V, I_D=46A, V_{GS}=10V	-	84	-	nC
Gate-Source Charge	Qgs		-	36	-	
Gate-Drain Charge	Qgd		-	25	-	
Source-Drain Diode characteristics						
Diode Forward voltage[a]	V_{SD}	T_J=25℃, V_{GS} =0V, I_S=46A	-	-	1.2	V
Diode Forward current	I_S	T_C=25℃	-	-	70	A
Body Diode Reverse Recovery Time	trr	T_J=25℃，IF=20A,di/dt=100A/us		145		ns
Body Diode Reverse Recovery Charge	Qrr	T_J=25℃，IF=20A,di/dt=100A/us		0.6		nc

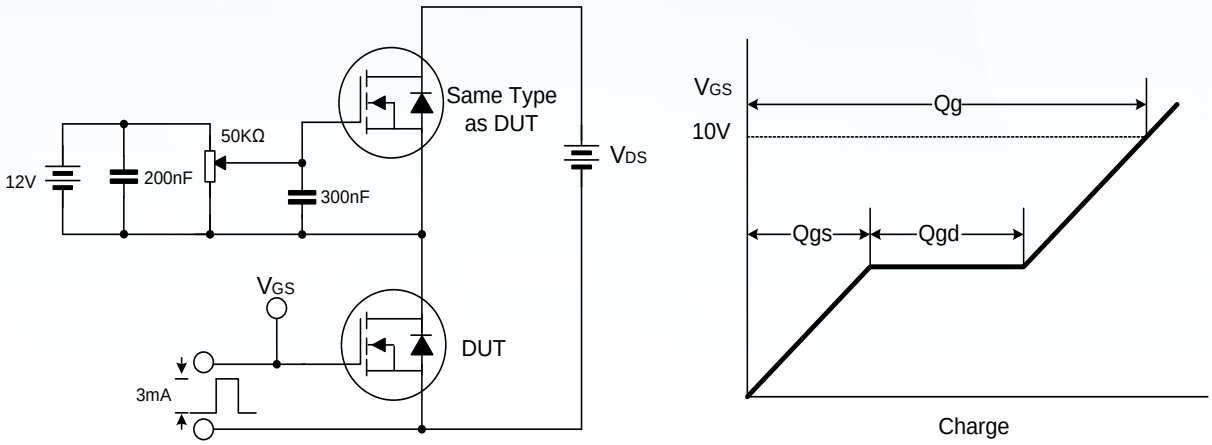
Notes:

a) Pulse width ≤ 300 μs, duty cycle ≤ 2%

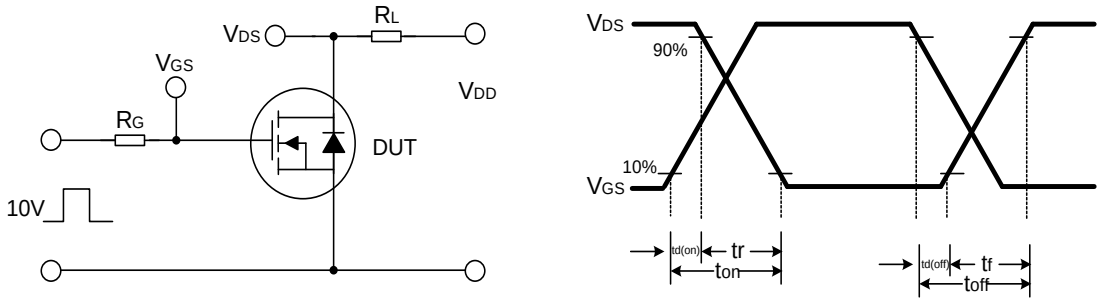
b) Guaranteed by design, not subject to production testing

Test Circuit

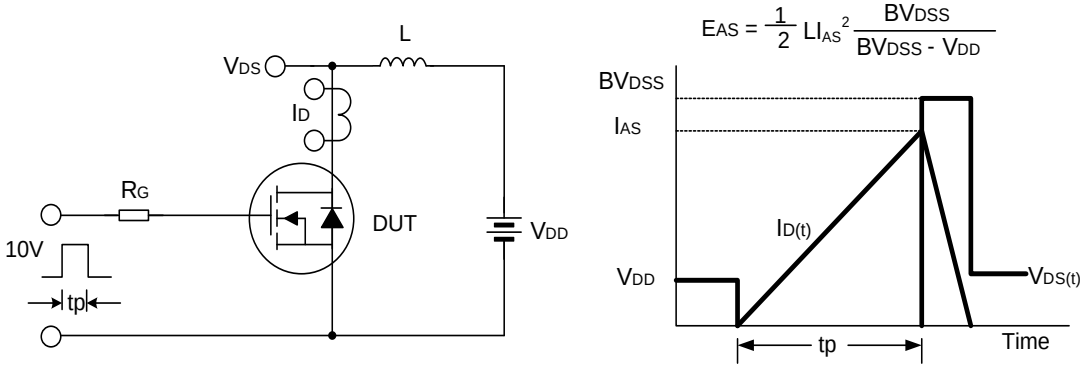
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching Test Circuit & Waveform



Typical Characteristics

Figure 1. Output Characteristics

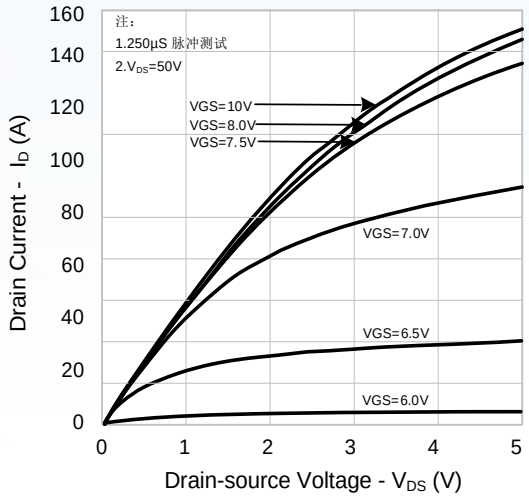


Figure 2. Transfer Characteristics

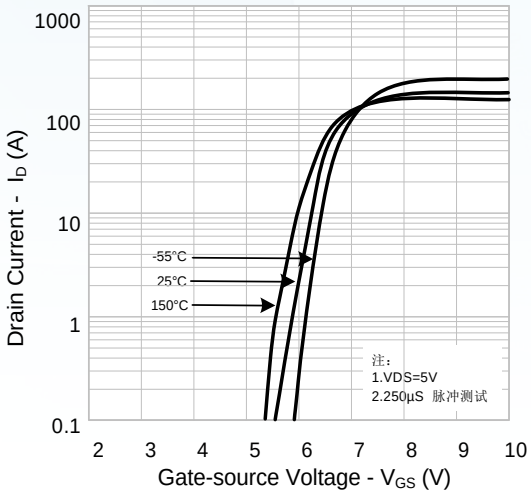


Figure 3. On-resistance vs. Drain Current

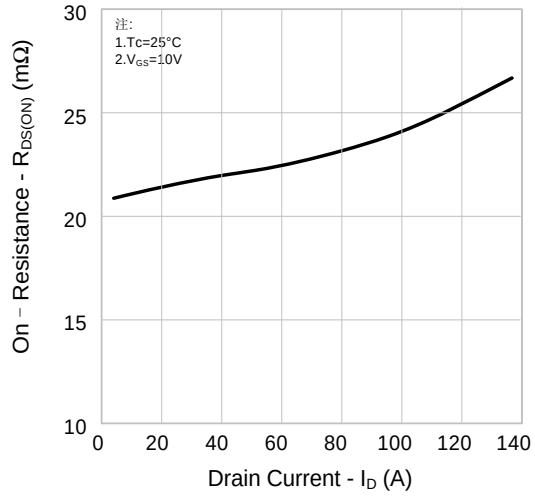


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Tem erature

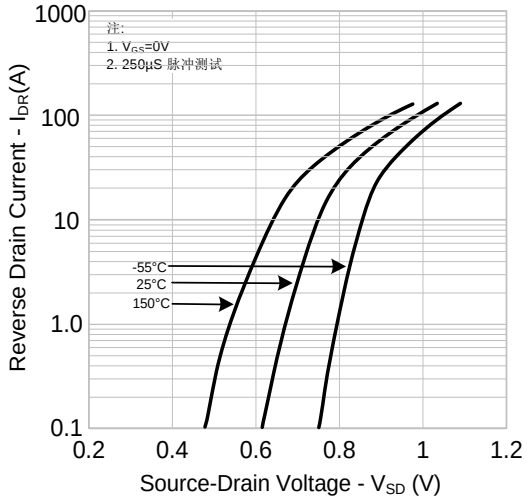


Figure 5. Capacitance Characteristics

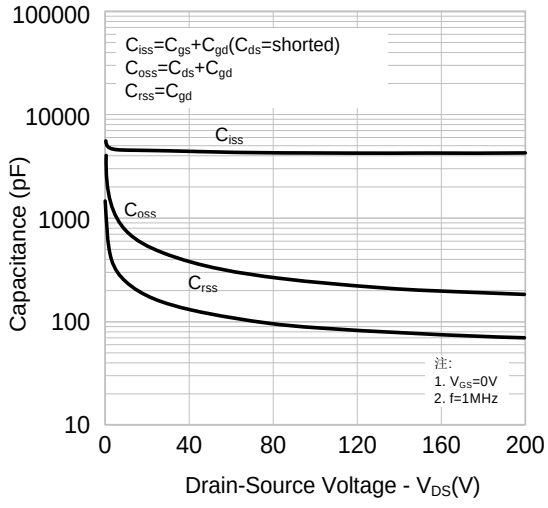
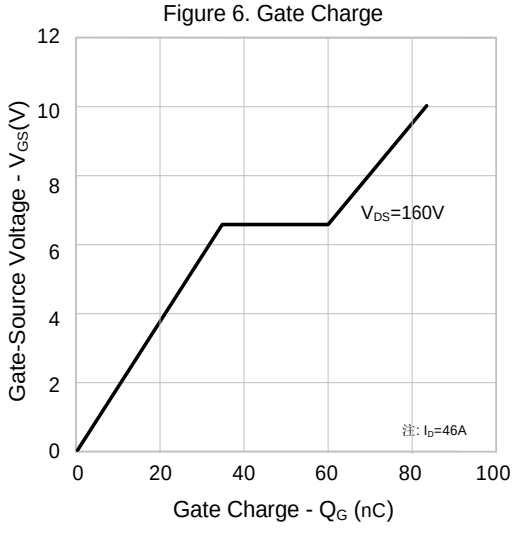


Figure 6. Gate Charge



Typical Characteristics

Figure 7. Breakdown Voltage vs. Temperature Characteristics

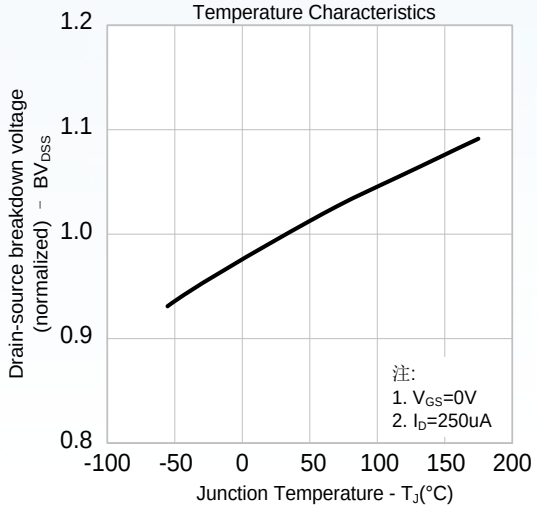


Figure 8. On-resistance vs. Temperature Characteristics

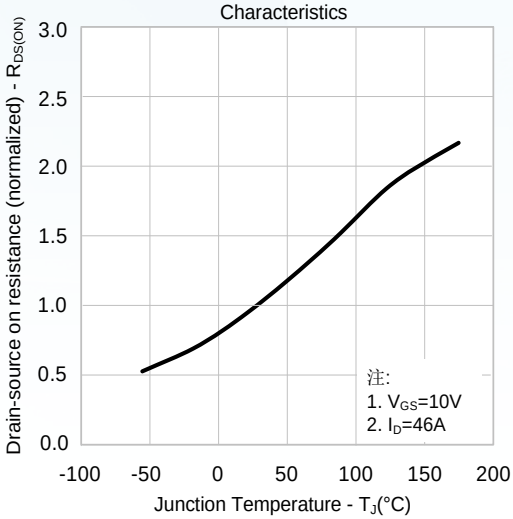
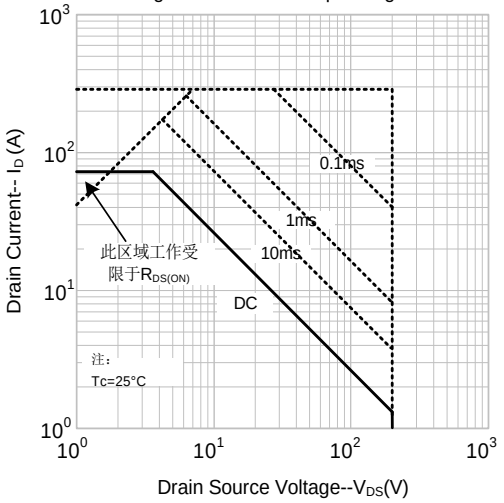
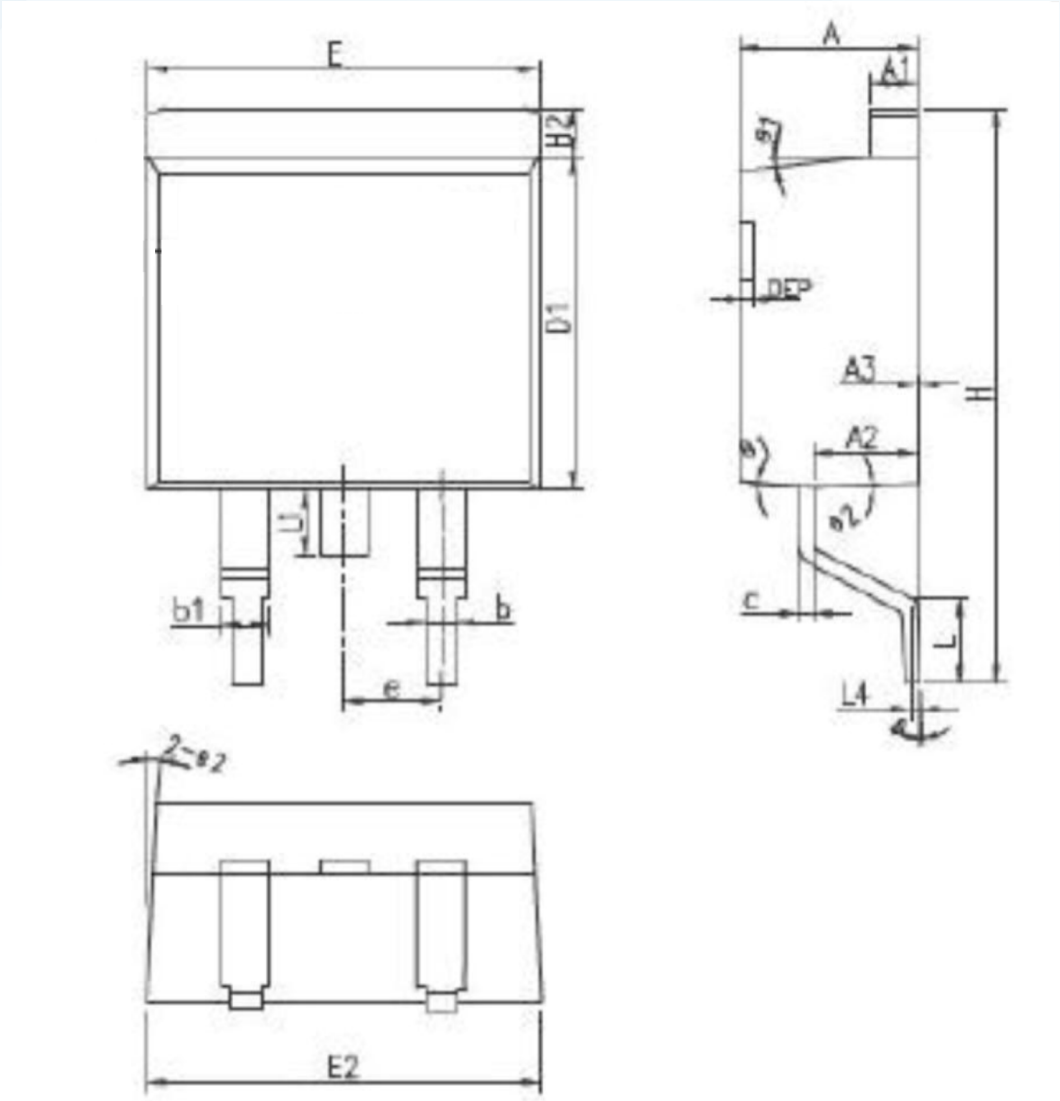


Figure 9. Max. Safe Operating Area



Package Mechanical Data TO-263



Symbol	Inches			Millimeters		
	Min	Nom	Max	Min	Nom	Max
A	4.40	4.57	4.57	0.173	0.180	0.185
A1	1.22	1.27	1.27	0.048	0.050	0.052
A2	2.59	2.69	2.69	0.102	0.106	0.110
A3	0.00	0.10	0.10	0.000	0.004	0.008
b	0.77	0.813	0.813	0.030	0.032	0.035
b1	1.20	1.270	1.270	0.047	0.050	0.054
c	0.34	0.381	0.381	0.013	0.015	0.019
D1	8.60	8.70	8.99	0.339	0.343	0.354
E	10.00	10.16	10.16	0.394	0.400	0.404
E2	10.00	10.10	10.10	0.394	0.398	0.402
e	2.54BSC			0.100BSC		
H	14.70	15.10	15.50	0.579	0.594	0.610
H2	1.17	1.27	1.40	0.046	0.050	0.055
L	2.00	2.30	2.60	0.079	0.091	0.102
L1	1.45	1.55	1.70	0.057	0.061	0.067
L4	0.25BSC			0.010BSC		
θ	0°	5°	8°	0°	5°	8°
θ1	5°	7°	9°	5°	7°	9°
θ2	1°	3°	5°	1°	3°	5°
DEP	0.05	0.10	0.20	0.002	0.004	0.008

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