EVVOSEMI®
THINK CHANGE DO

ESD TVS MOS LDO Diode Sensor DC-DC

Product Specification

Domestic Part Number	IRF1018E
Overseas Part Number	IRF1018E
Equivalent Part Number	IRF1018E

60V N-Channel Enhancement Mode MOSFET

Description

The IRF1018E is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The IRF1018E meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

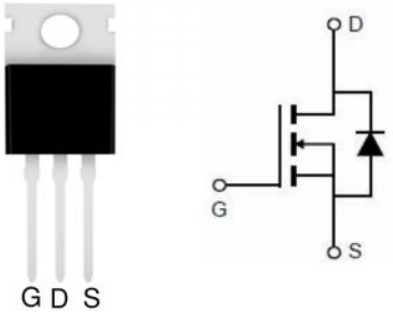
- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

Product Summary

V_{DS}=60V I_D=80A

$R_{DS(ON)}$=6.5mΩ@V_{GS} =10V

TO-220-3L Pin Configuration



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain source voltage	VDS	60	V
Gate source voltage	VGS	±20	V
Continuous drain current[1)]	ID	80	A
Pulsed drain current[2)]	ID, pulse	180	A
Power dissipation[3)]	P_D	125	W
Single pulsed avalanche energy[4)]	EAS	30	mJ
Operation and storage temperature	Tstg，Tj	-55 to 150	℃
Thermal resistance, junction-case	RθJC	1	°C/W
Thermal resistance, junction-ambient[5)]	RθJA	62	°C/W

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Electrical Characteristics (TJ=25℃ unless otherwise specified)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-source breakdown voltage	V_{GS}=0 V, I_D=250 μA	60	71		V
$V_{GS(th)}$	Gate threshold voltage	V_{DS}=V_{GS}, I_D=250 μA	2.0	3.0	4	V
$R_{DS(ON)}$	Drain-source on-state resistance	V_{GS}=10 V, I_D=20 A		6.5	8	mΩ
I_{GSS}	Gate-source leakage current	V_{GS}=20 V			100	nA
		V_{GS}=-20 V			-100	
I_{DSS}	Drain-source leakage current	V_{DS}=40 V, V_{GS}=0 V			1	μA
C_{iss}	Input capacitance	V_{GS}=0 V, V_{DS}=50 V, f=100 kHz		1182.1		pF
C_{oss}	Output capacitance			199.5		pF
C_{rss}	Reverse transfer capacitance			4.1		pF
$t_{d(on)}$	Turn-on delay time	V_{GS}=10 V, V_{DS}=50 V, R_G=2 Ω, I_D=10 A		17.9		ns
t_r	Rise time			4.0		ns
$t_{d(off)}$	Turn-off delay time			34.9		ns
t_f	Fall time			5.5		ns
Q_g	Total gate charge	I_D=10 A, V_{DS}=50 V, V_{GS}=10 V		18.4		nC
Q_{gs}	Gate-source charge			3.3		nC
Q_{gd}	Gate-drain charge			3.1		nC
$V_{plateau}$	Gate plateau voltage			2.8		V
I_S	Diode forward current	V_{GS}<V_{th}			60	A
I_{SP}	Pulsed source current				180	
V_{SD}	Diode forward voltage	I_S=20 A, V_{GS}=0 V			1.3	V
t_{rr}	Reverse recovery time	I_S=10 A, di/dt=100 A/μs		41.8		ns
Q_{rr}	Reverse recovery charge			36.1		nC
I_{rrm}	Peak reverse recovery current			1.4		A

Note

1) Calculated continuous current based on maximum allowable junction temperature.
2) Repetitive rating; pulse width limited by max. junction temperature.
3) Pd is based on max. junction temperature, using junction-case thermal resistance.
4) V_{DD}=50 V, R_G=50 Ω, L=0.3 mH, starting T_j=25 ℃.
5) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 ℃.

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Typical Performance Characteristics

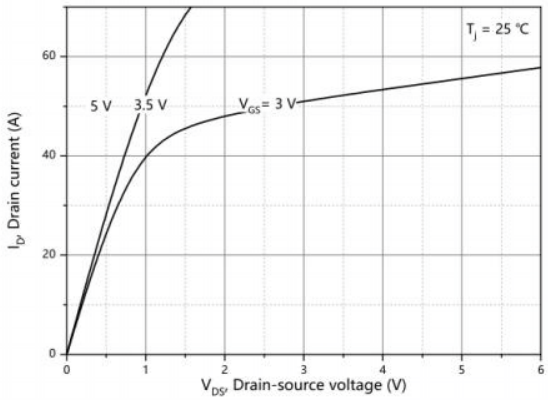

Figure 1, Typ. output characteristics

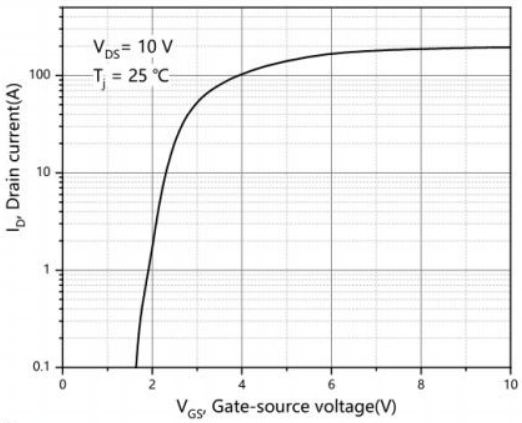

Figure 2, Typ. transfer characteristics

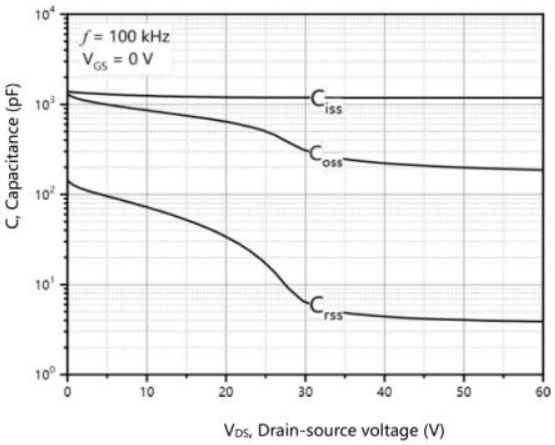

Figure 3, Typ. capacitances

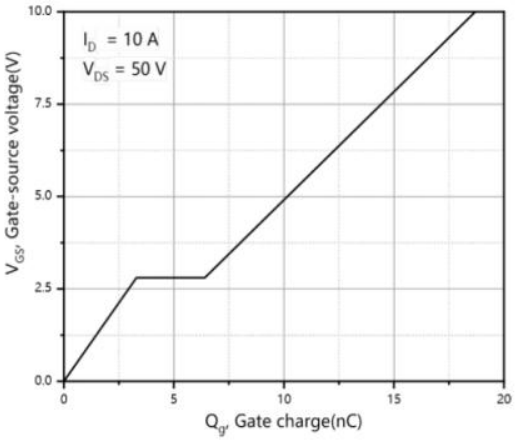

Figure 4, Typ. gate charge

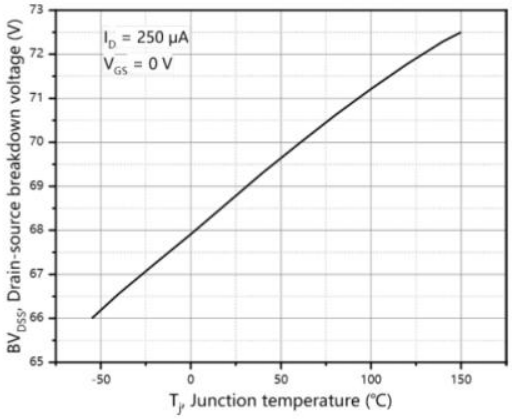

Figure 5, Drain-source breakdown voltage

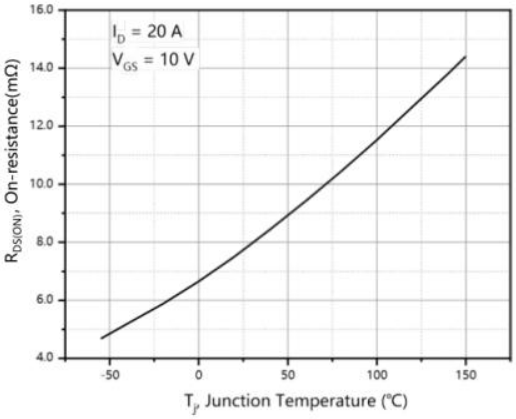

Figure 6, Drain-source on-state resistance

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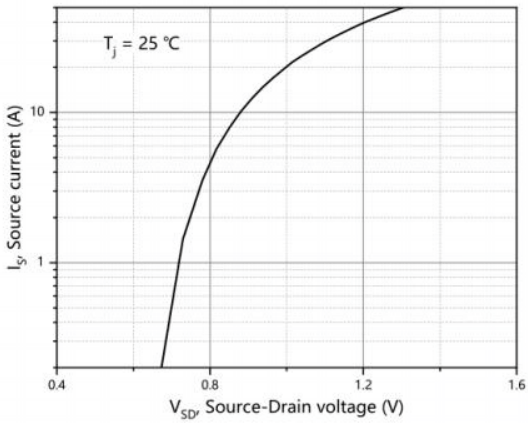


Figure 7, Forward characteristic of body diode

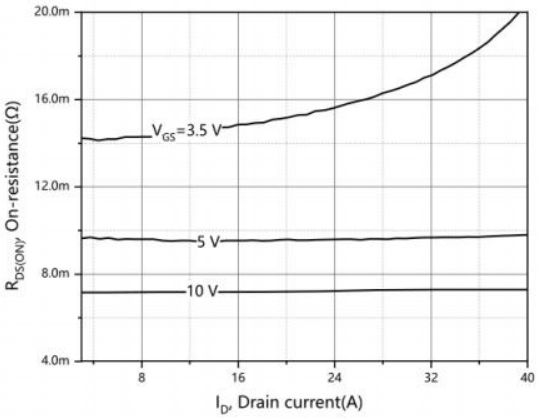


Figure 8, Drain-source on-state resistance

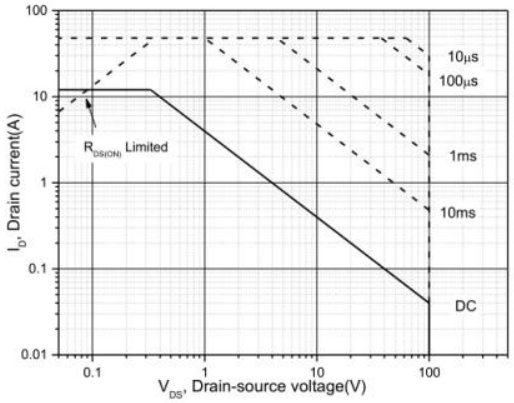


Figure 9, Safe operation area T_C=25 ℃

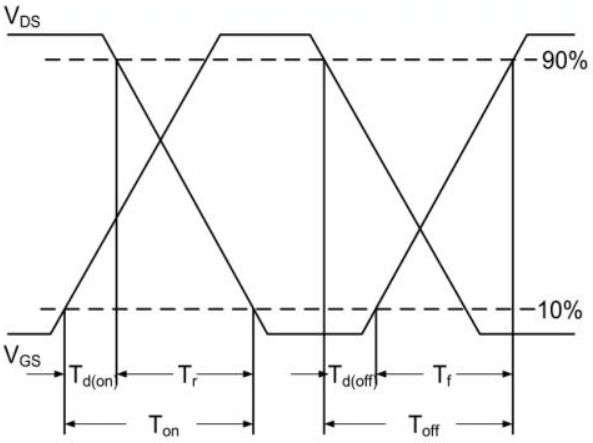


Fig.10 Switching Time Waveform

$$EAS = \frac{1}{2} L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$

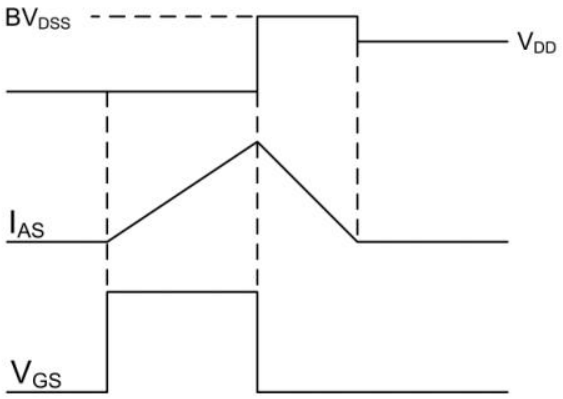
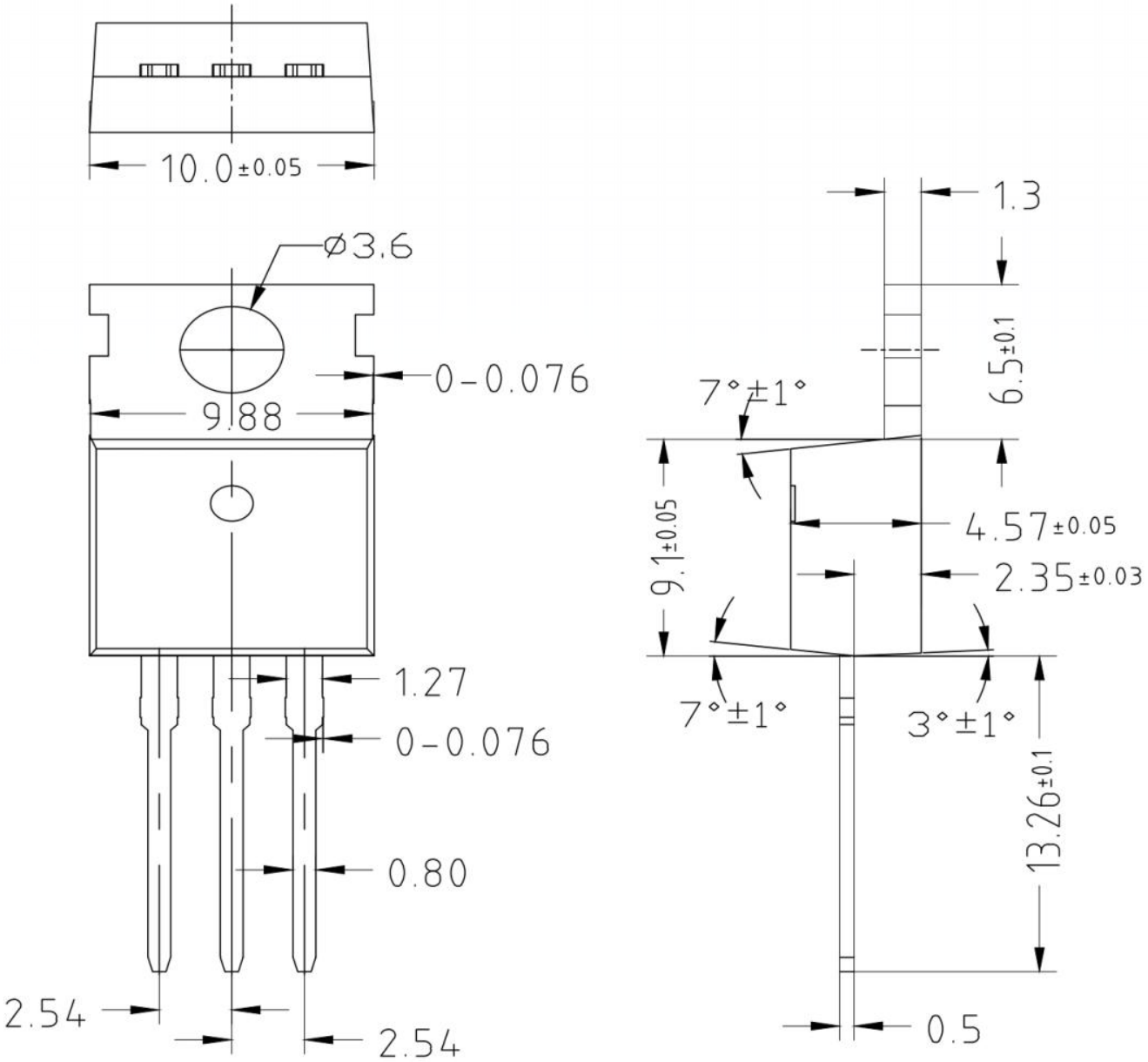


Fig.11 Unclamped Inductive Switching Waveform


10.0±0.05
Ø3.6
0-0.076
9.88
1.27
0-0.076
0.80
2.54
2.54
1.3
6.5±0.1
7°±1°
9.1±0.05
4.57±0.05
2.35±0.03
7°±1°
3°±1°
13.26±0.1
0.5

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