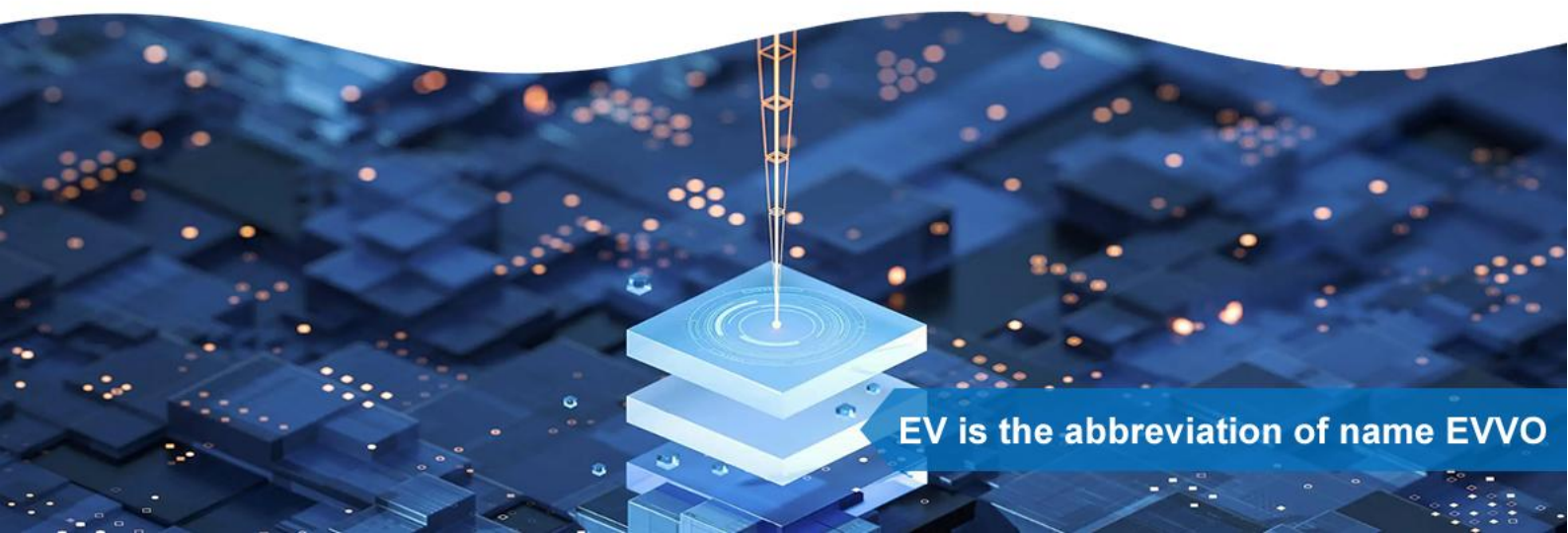
EVVOSEMI®
THINK CHANGE DO

ESD TVS MOS LDO Diode Sensor DC-DC

Product Specification

Domestic Part Number	IRFB52N15D
Overseas Part Number	IRFB52N15D
Equivalent Part Number	IRFB52N15D



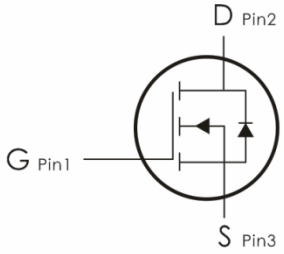
Description：

This N-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.

Features：

1) V_{DS}=150V,I_D=40A, $R_{DS(ON)}$<45mΩ @V_{GS}=10V
2) Low gate charge.
3) Green device available.
4) Advanced high cell denity trench technology for ultra low $R_{DS(ON)}$.
5) Excellent package for good heat dissipation.



Absolute Maximum Ratings： (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current- T_C=25℃	40	A
	Continuous Drain Current-T_C=100℃	29	
E_{AS}	Single Pulse Avalanche Energy(note1)	310	mJ
P_D	Power Dissipation	140	W
I_{AR}	Avalanche Current (note2)	40	A
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+175	℃
TL	Maximum lead temperature for soldering purpose,1/8" from case for 5 seconds	300	℃

Thermal Characteristics：

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case	1.07	℃/W

Electrical Characteristics: (T_C=25℃ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	150	170	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=150V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics (Note 3)						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	2.5	3.2	4.5	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=10V,I_D=18A	---	35	45	mΩ
G_{FS}	Forward Transconductance	V_{DS}=15V,I_D=18A	38	---	---	S
Dynamic Characteristics(Note 4)						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	---	3850	---	pF
C_{oss}	Output Capacitance		---	185	---	
C_{rss}	Reverse Transfer Capacitance		---	86	---	
Switching Characteristics(Note 4)						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=30V, , I_D=2A, R_L=15Ω V_{GS}=10V ,R_G=2.5Ω .	---	17.8	---	ns
t_r	Rise Time		---	11.8	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	56	---	ns
t_f	Fall Time		---	14.6	---	ns
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=30V I_D=30A	---	105	---	nC
Q_{gs}	Gate-Source Charge		---	21	---	nC
Q_{gd}	Gate-Drain Charge		---	31.5	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage (Note 3)	V_{GS}=0V ,I_S=18A	---	0.82	1.2	V
Is	Diode Forward Current(Note 2)	---	---	---	40	A

Trr	Reverse Recovery Time	TJ = 25°C, IF = 18A diF/dt=100A/μs (Note3)	---	70	---	NS
Qrr	Reverse Recovery Charge		---	230	---	NC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition: Tj=25℃, V_{DD}=50V,V_G=10V,L=0.5mH,Rg=25Ω

Typical Characteristics： (T_C=25℃ unless otherwise noted)

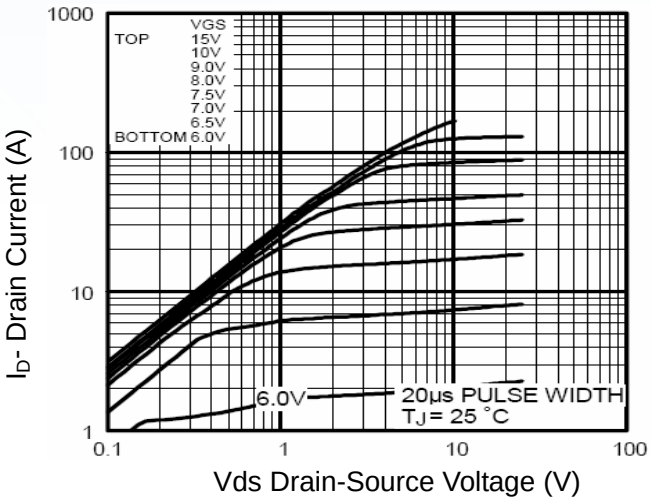


Figure 1 Output Characteristics

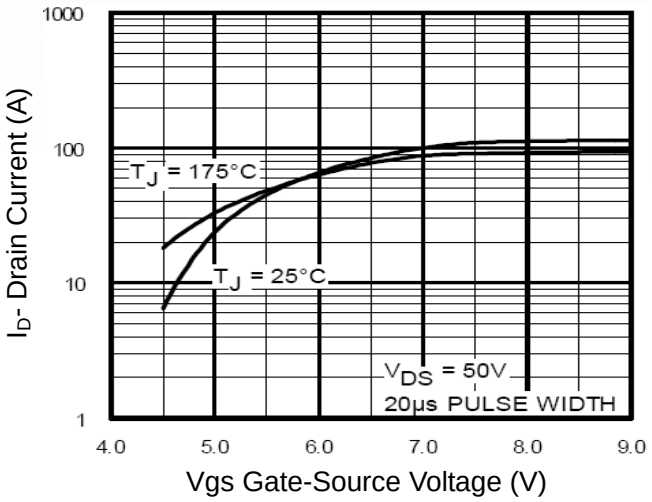


Figure 2 Transfer Characteristics

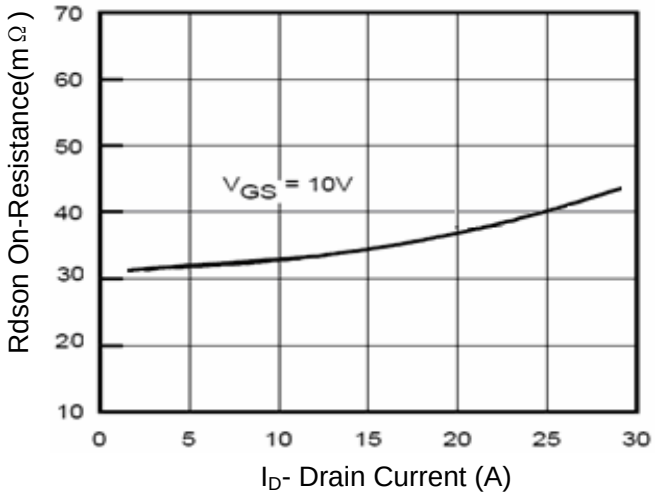


Figure 3 Rdson- Drain Current

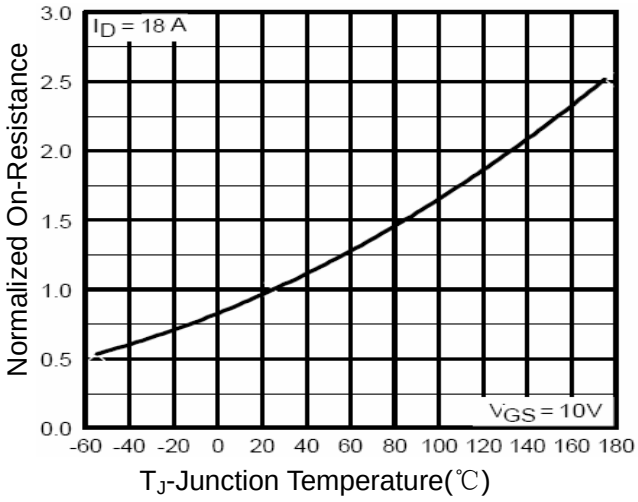


Figure 4 Rdson-JunctionTemperature

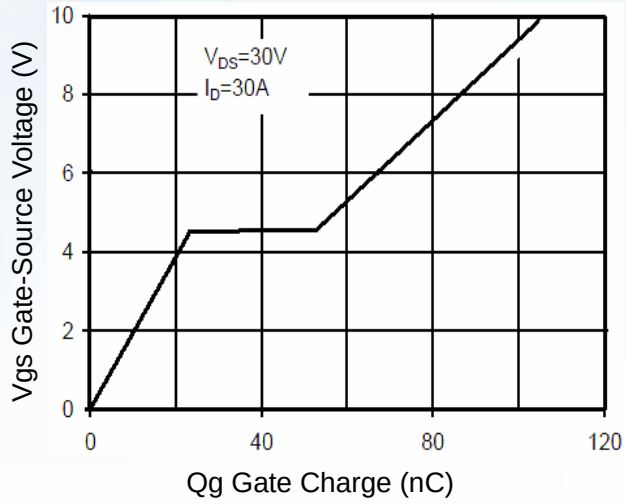


Figure 5 Gate Charge

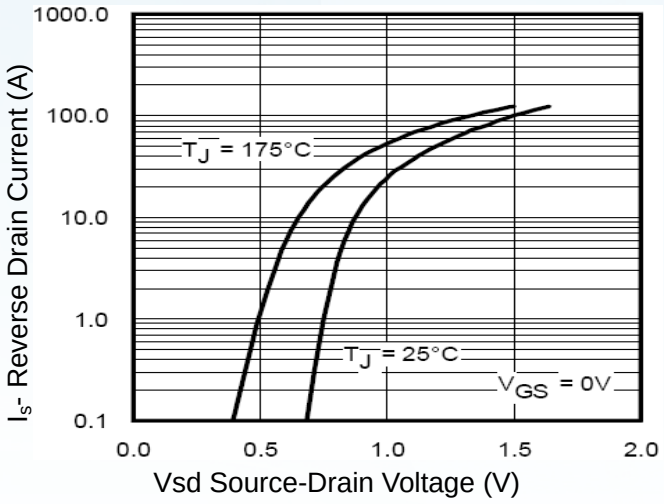


Figure 6 Source- Drain Diode Forward

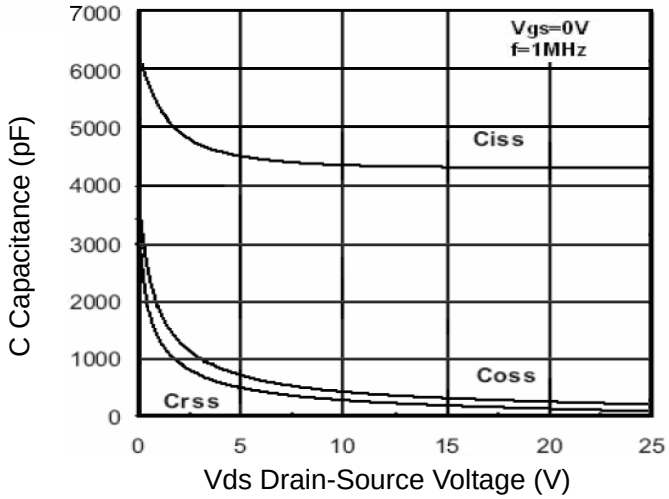


Figure 7 Capacitance vs Vds

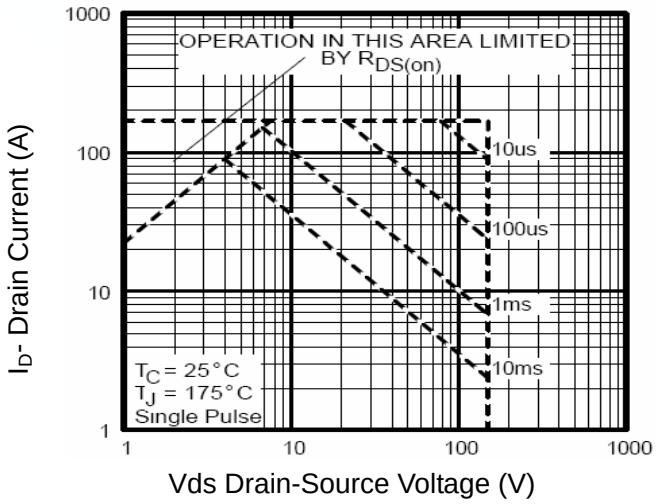


Figure 8 Safe Operation Area

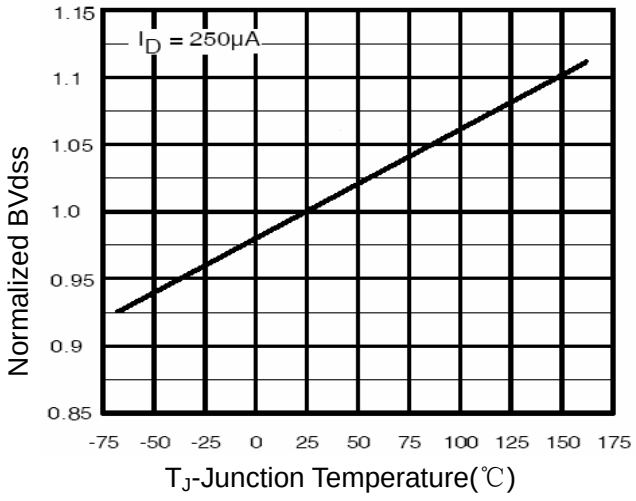


Figure 9 BV_{DSS} vs Junction Temperature

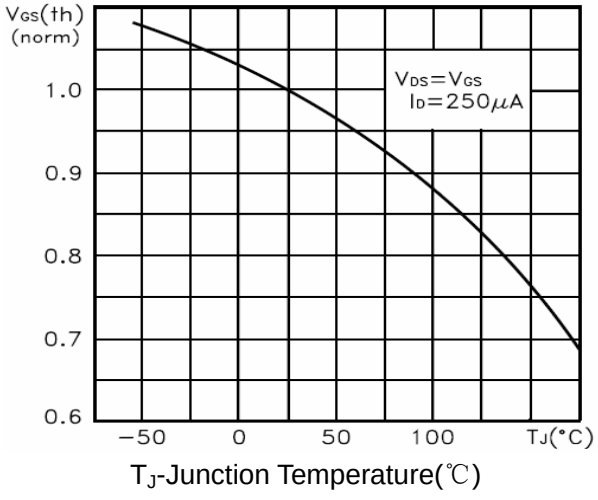


Figure 10 $V_{GS(th)}$ vs Junction Temperature

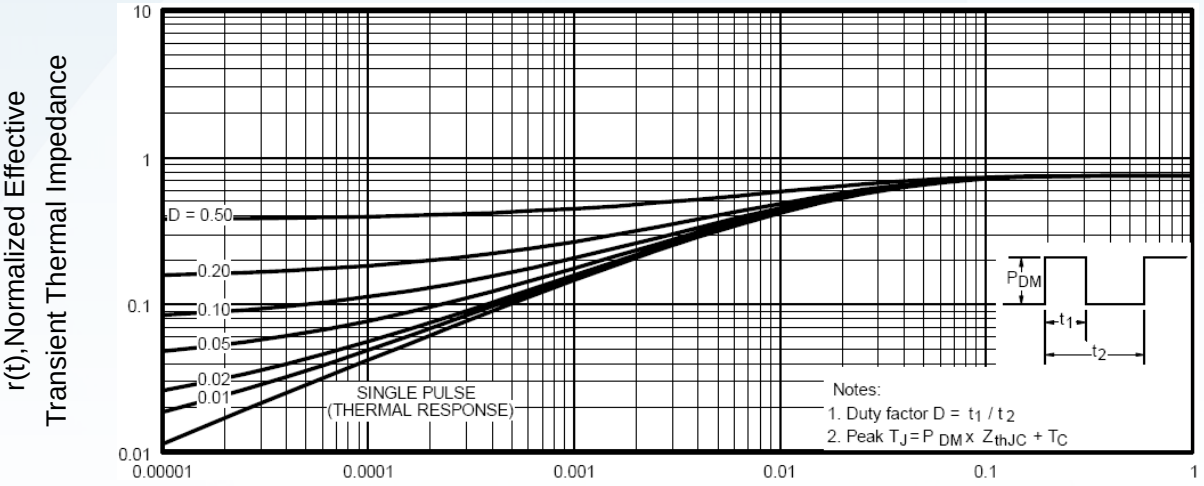


Figure 11 Normalized Maximum Transient Thermal Impedance

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