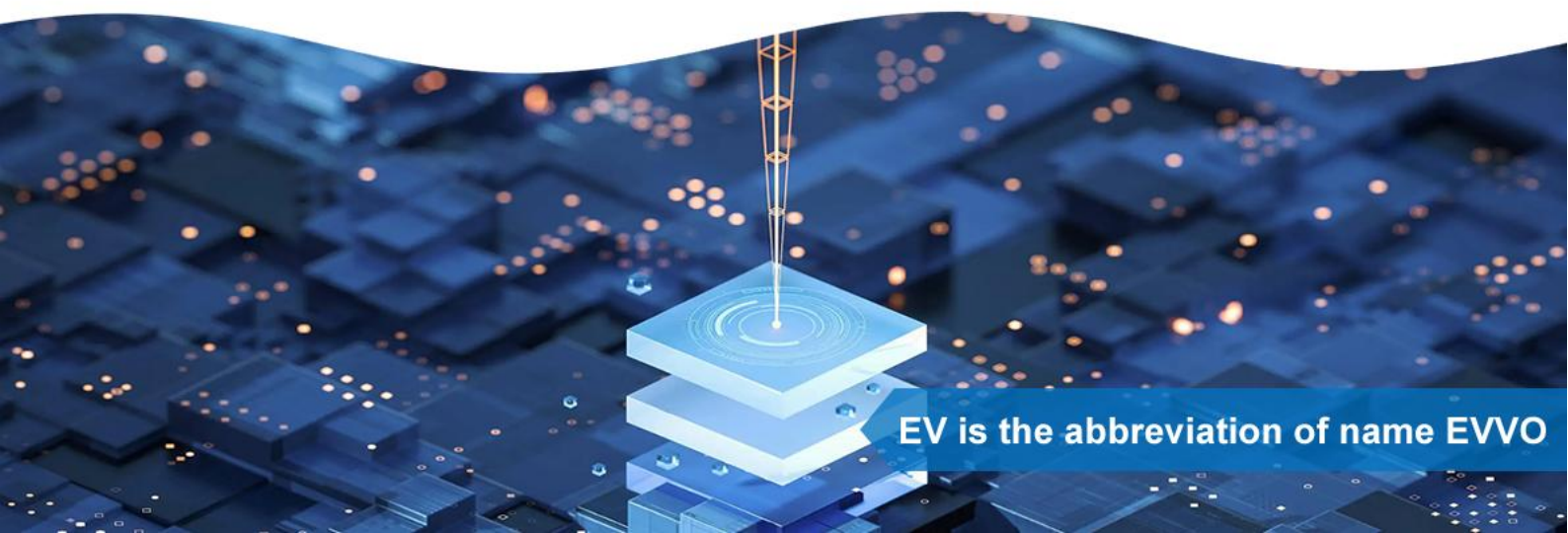
EVVOSEMI®
THINK CHANGE DO

ESD TVS MOS LDO Diode Sensor DC-DC

Product Specification

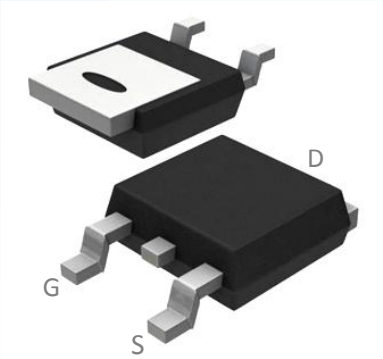
Domestic Part Number	IRFR2407
Overseas Part Number	IRFR2407
Equivalent Part Number	IRFR2407



Description：

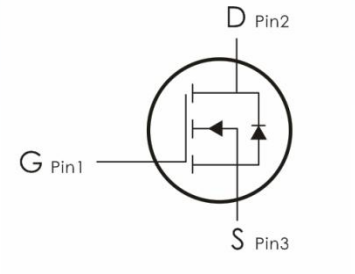
This N-Channel MOSFET uses advanced SGT technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.



Features：

1) V_{DS}=80V,I_D=45A,$R_{DS(ON)}$<20m Ω @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	80	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current[1)]	45	A
$I_{D, pulse}$	Pulsed drain current[2)]	135	A
I_S	Continuous diode forward current[1)]	45	A
$I_{S, pulse}$	Diode pulsed current[2)]	135	A
P_D	Continuous-Source Current[3)]	75	W
E_{AS}	Single pulsed avalanche energy[5)]	22	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	℃

Thermal Characteristics：

Symbol	Parameter	Max	Units
$R_{\Theta JC}$	Thermal Resistance,Junction to Case	1.67	℃/W
$R_{\Theta JA}$	Thermal Resistance,Junction to Ambient[4)]	62	

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	80	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=80V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
R_G	Gate resistance	f=1 MHz, Open drain	---	2.9	---	Ω
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1.0	---	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance	V_{GS}=10V,I_D=12A	---	13	20	mΩ
		V_{GS}=4.5V,I_D=9A	---	17	24	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	---	760	---	pF
C_{oss}	Output Capacitance		---	340	---	
C_{rss}	Reverse Transfer Capacitance		---	27	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{Ds}=40V, I_D=20A, V_{GS}=10V,R_G=2Ω	---	16	--	ns
t_r	Rise Time		---	4	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	28	---	ns
t_f	Fall Time		---	5.1	---	ns
Q_g	Total Gate Charge	V_{GS}=10V, V_{DS}=40V, I_D=20A	---	12	---	nC
Q_{gs}	Gate-Source Charge		---	2.2	---	nC
Q_{gd}	Gate-Drain “Miller” Charge		---	2.5	---	nC
$V_{plateau}$	Gate plateau voltage		---	3.2	---	V
Drain-Source Diode Characteristics						

V_{SD}	Source-Drain Diode Forward Voltage	V_{GS}=0V,I_S=20A	---	---	1.3	V
trr	Reverse Recovery Time	V_R=40V,I_S =20 A dI_{SD}/dt = 100 A/ μ s	---	30	---	Ns
qrr	Reverse Recovery Charge			19	---	uc
Irrm	Peak reverse recovery current		---	1	---	A

Notes:

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) 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 °C.
5) V_{DD}=50 V,V_{GS}=10 V, L=0.3 mH, starting T_j=25 °C.

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

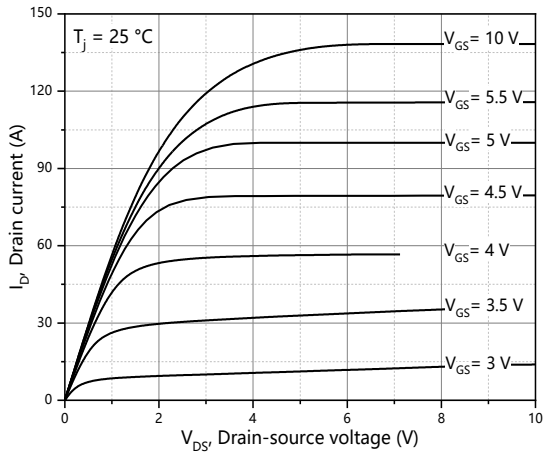


Figure 1. Typ. output characteristics

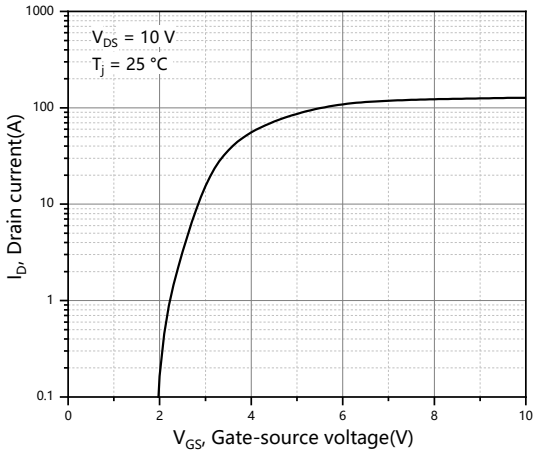


Figure 2. Typ. transfer characteristics

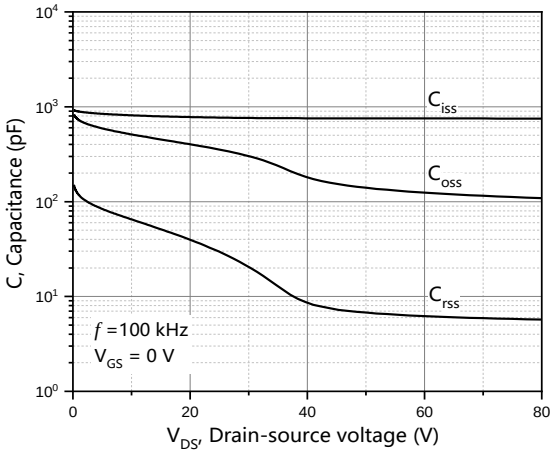


Figure 3. Typ. capacitances

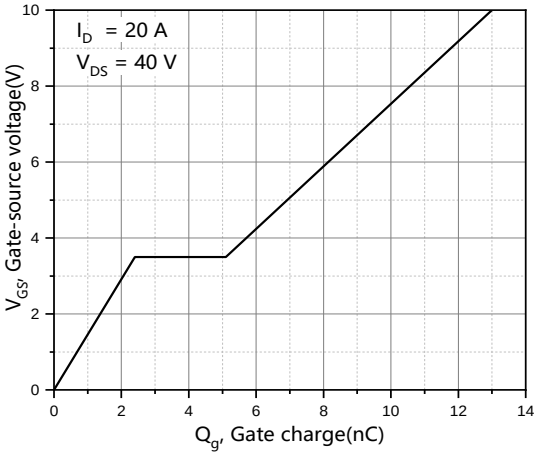


Figure 4. Typ. gate charge

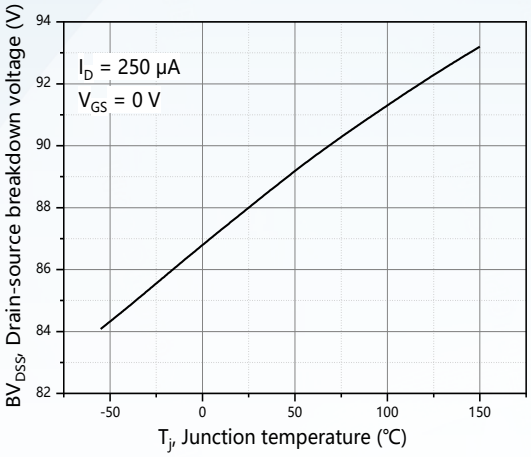


Figure 5. Drain-source breakdown voltage

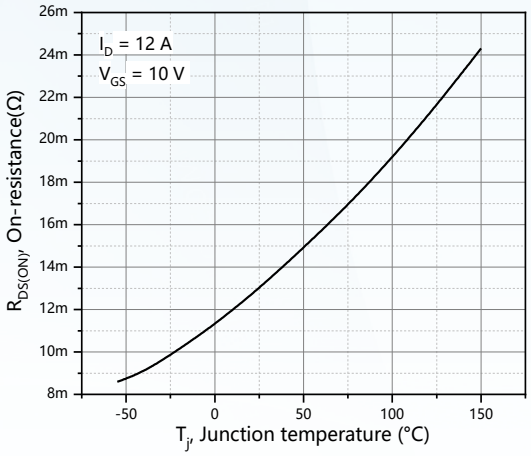


Figure 6. Drain-source on-state resistance

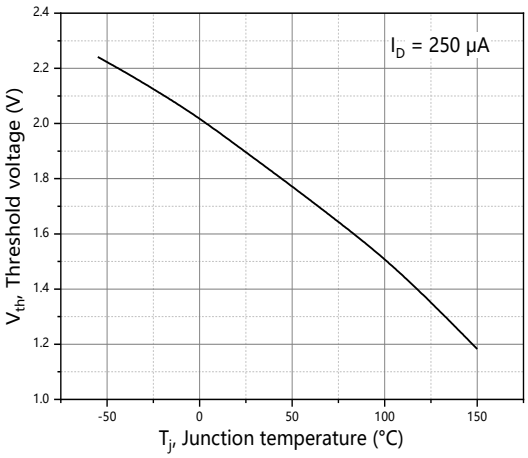


Figure 7. Threshold voltage

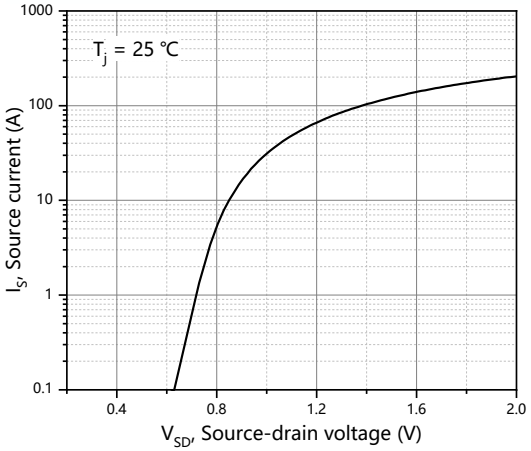


Figure 8. Forward characteristic of body diode

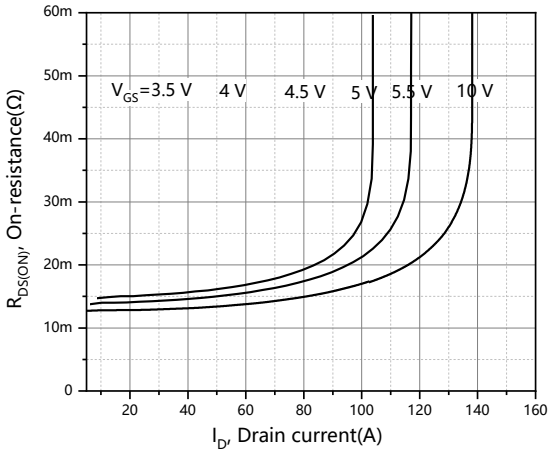


Figure 9. Drain-source on-state resistance

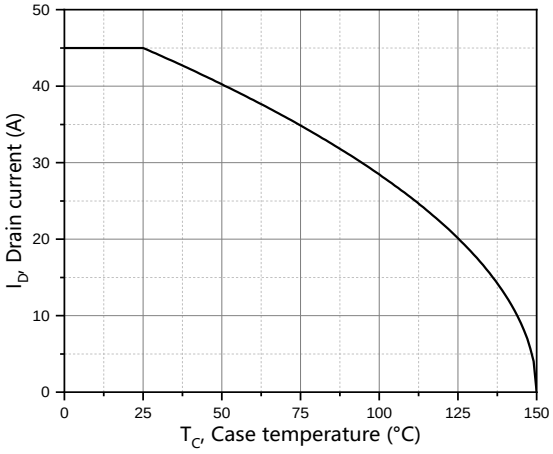


Figure 10. Drain current

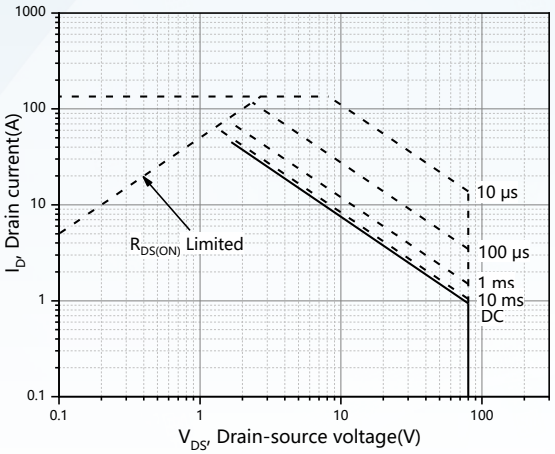


Figure 11. Safe operation area T_C=25℃

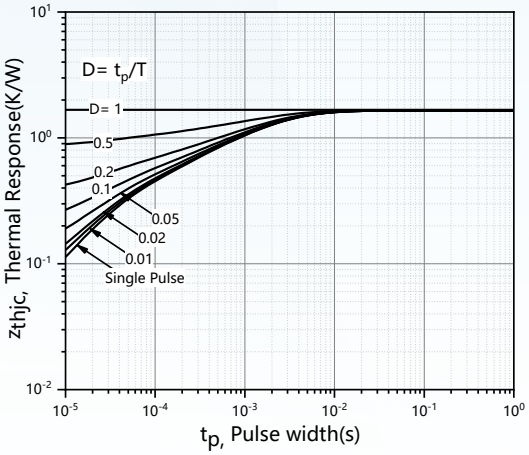


Figure 12. Max. transient thermal impedance

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