EVVOSEMI®
THINK CHANGE DO

ESD TVS MOS LDO Diode Sensor DC-DC

Product Specification

Domestic Part Number	IRFB7434G
Overseas Part Number	IRFB7434G
Equivalent Part Number	IRFB7434G

40V N-Channel Enhancement Mode MOSFET

Description

40V /180A Power MOSFET

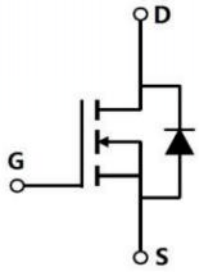
Very low on-resistance RDS(on) @ VGS=4.5 V

Pb-free lead plating; RoHS compliant

General Features

V_{DS}	40	V
$R_{DS(on),TYP@VGS=10V}$	2.6	mΩ
$R_{DS(on),TYP@VGS=4.5}$	3.5	mΩ
I_D	180	A

TO-220-3L Pin Configuration



Absolute Maximum Ratings (T_C=25℃ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain source voltage	V_{DS}	40	V
Gate source voltage	V_{GS}	±20	V
Continuous drain current[1]	I_D	180	A
Pulsed drain current[2]	$I_{D, pulse}$	390	A
Power dissipation[3]	P_D	140	W
Single pulsed avalanche energy[4]	E_{AS}	200	mJ
Operation and storage temperature	T_{stg}, T_j	-55 to 150	℃
Thermal resistance, junction-case	$R_{\theta JC}$	0.89	°C/W
Thermal resistance, junction-ambient[5]	$R_{\theta JA}$	62	°C/W

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Electrical Characteristics (T_J=25℃, unless otherwise noted)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-source breakdown voltage	BV_{DSS}	40			V	V_{GS}=0 V, I_D=250 μA
Gate threshold voltage	$V_{GS(th)}$	1.0		2.5	V	V_{DS}=V_{GS}, I_D=250 μA
Drain-source on-state resistance	$R_{DS(ON)}$		2.6	2.8	mΩ	V_{GS}=10 V, I_D=55 A
Drain-source on-state resistance	$R_{DS(ON)}$		3.0	3.5	mΩ	V_{GS}=4.5 V, I_D=55 A
Gate-source leakage current	I_{GSS}			100	nA	V_{GS}=20 V
				-100		V_{GS}=-20 V
Drain-source leakage current	I_{DSS}			1	μA	V_{DS}=40 V, V_{GS}=0 V
Input capacitance	C_{iss}		6587.4		pF	V_{GS}=0 V, V_{DS}=20 V, f=100 kHz
Output capacitance	C_{oss}		2537.3		pF	
Reverse transfer capacitance	C_{rss}		178.8		pF	
Turn-on delay time	$t_{d(on)}$		26.6		ns	V_{GS}=10 V, V_{DS}=20 V, R_G=2 Ω, I_D=20 A
Rise time	t_r		9.3		ns	
Turn-off delay time	$t_{d(off)}$		96		ns	
Fall time	t_f		39.3		ns	
Total gate charge	Q_g		96.8		nC	I_D=20 A, V_{DS}=20 V, V_{GS}=10 V
Gate-source charge	Q_{gs}		14.5		nC	
Gate-drain charge	Q_{gd}		18.4		nC	
Gate plateau voltage	$V_{plateau}$		2.7		V	
Diode forward current	I_S			130	A	V_{GS}<V_{th}
Pulsed source current	I_{SP}			390		
Diode forward voltage	V_{SD}			1.3	V	I_S=20 A, V_{GS}=0 V
Reverse recovery time	t_{rr}		205		ns	I_S=20 A, di/dt=100 A/μs
Reverse recovery charge	Q_{rr}		557.4		nC	
Peak reverse recovery current	I_{rrm}		4.3		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}=30 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 ℃.

Typical Characteristics

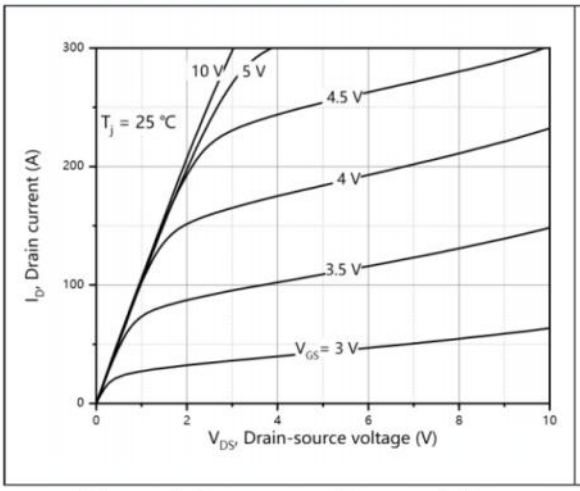

Figure 1, Typ. output characteristics

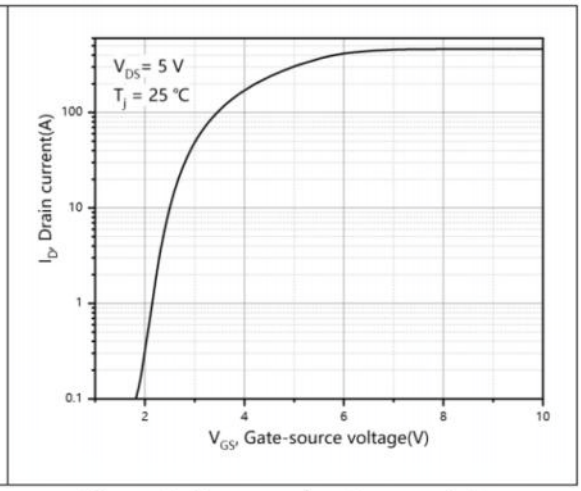

Figure 2, Typ. transfer characteristics

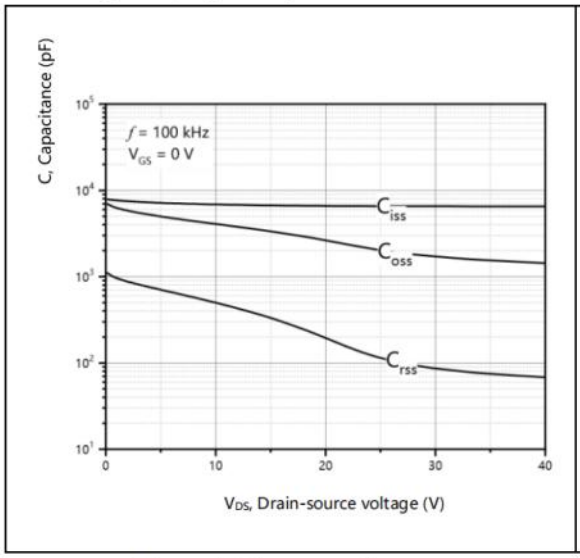

Figure 3, Typ. capacitances

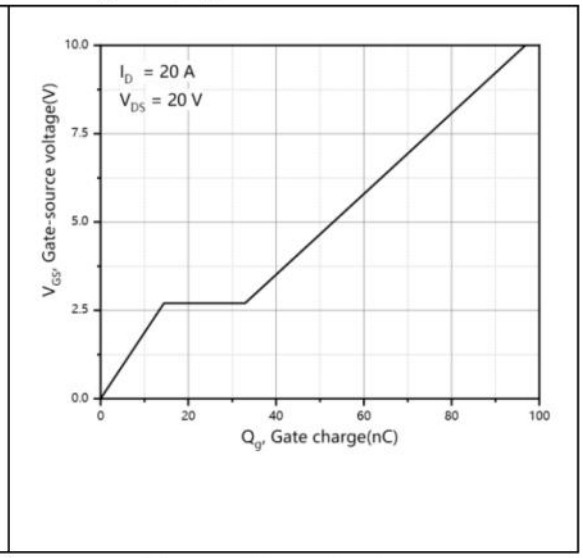

Figure 4, Typ. gate charge

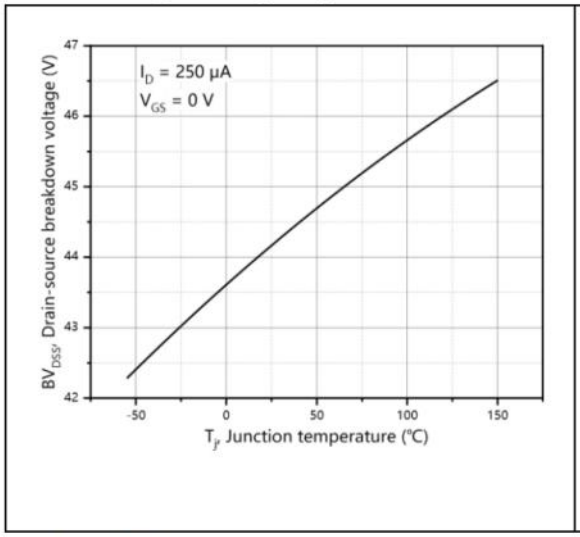

Figure 5, Drain-source breakdown voltage

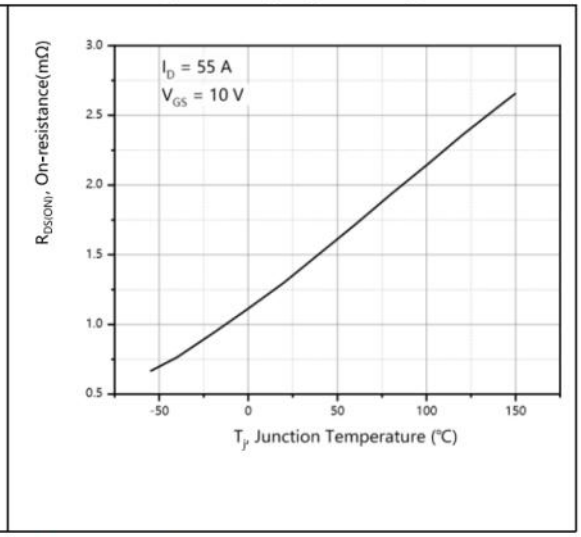

Figure 6, Drain-source on-state resistance

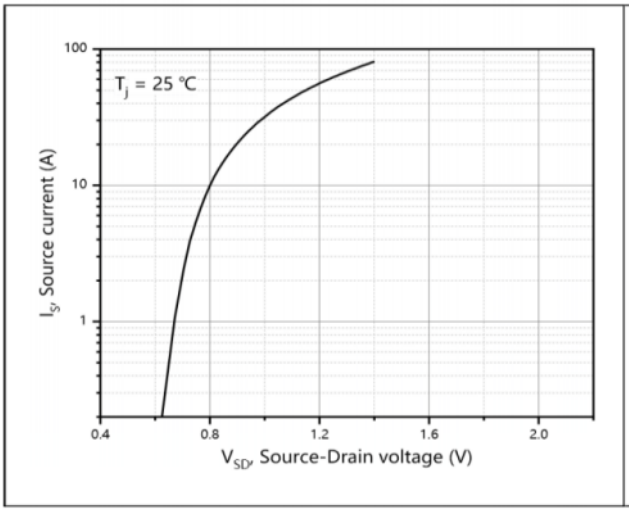

Figure 7, Forward characteristic of body diode

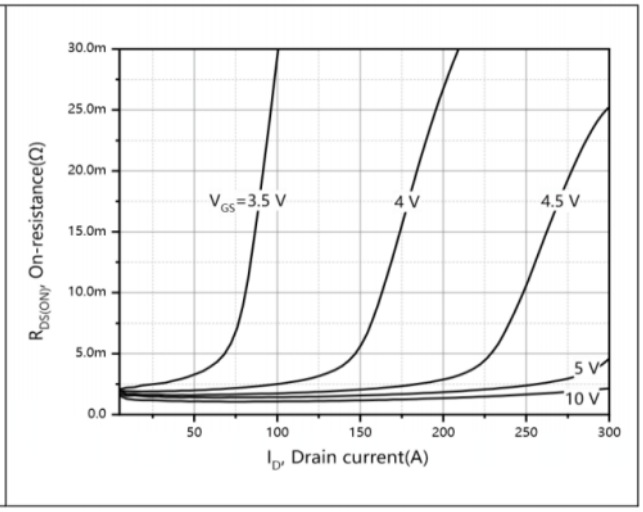

Figure 8, Drain-source on-state resistance

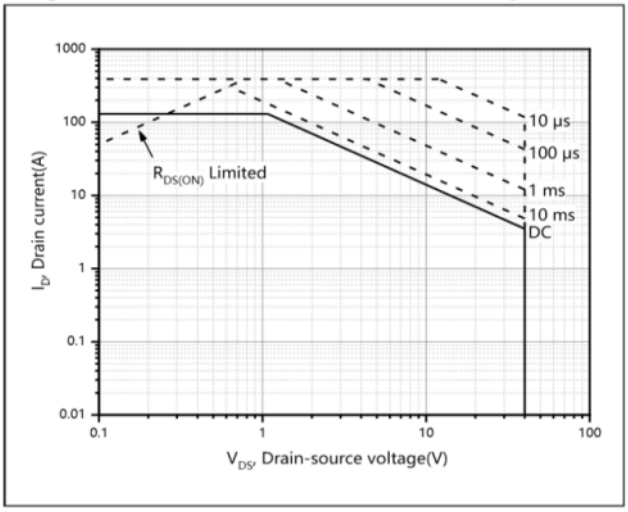

Figure 9, Safe operation area T_C=25 °C

Test circuits and waveforms

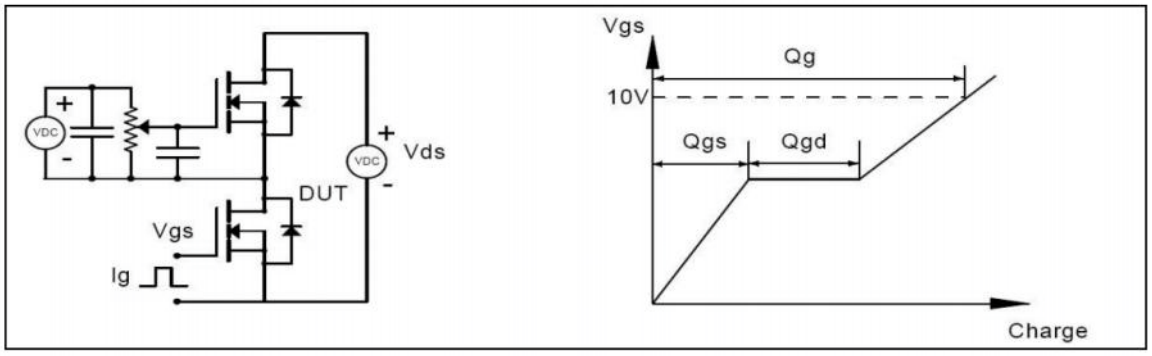

Figure 1, Gate charge test circuit & waveform

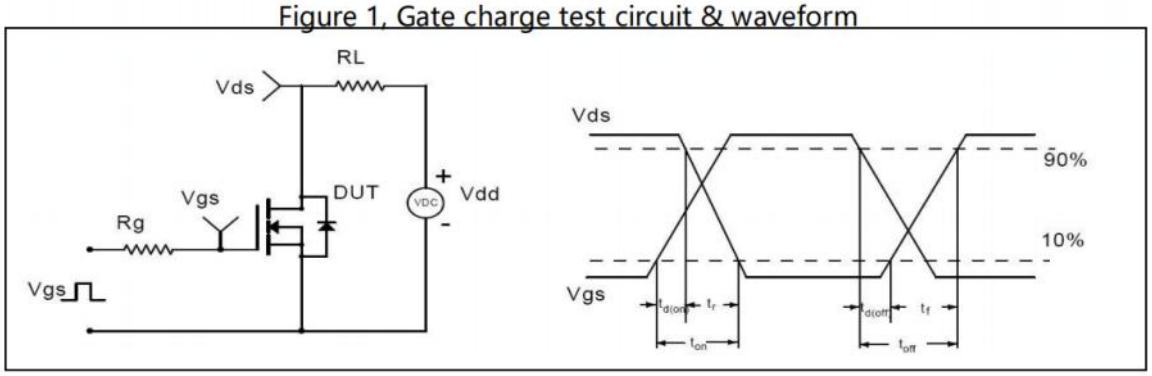

Figure 2, Switching time test circuit & waveforms

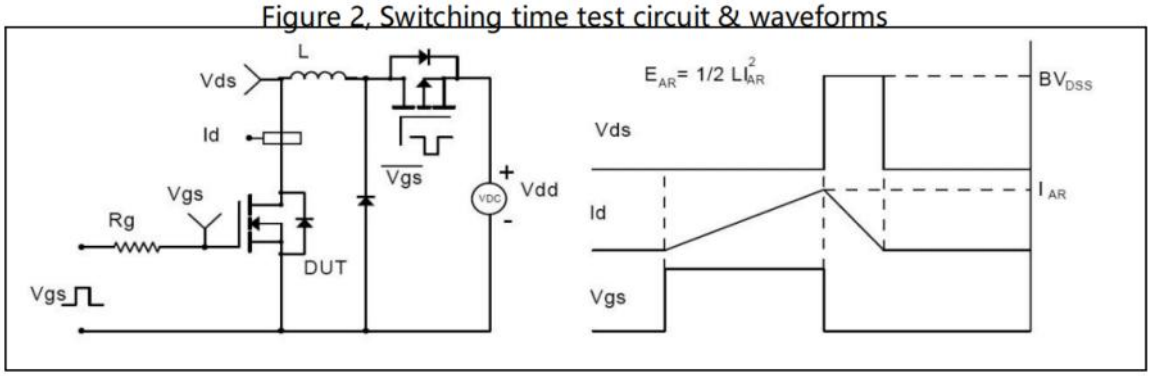

Figure 3, Unclamped inductive switching (UIS) test circuit & waveforms

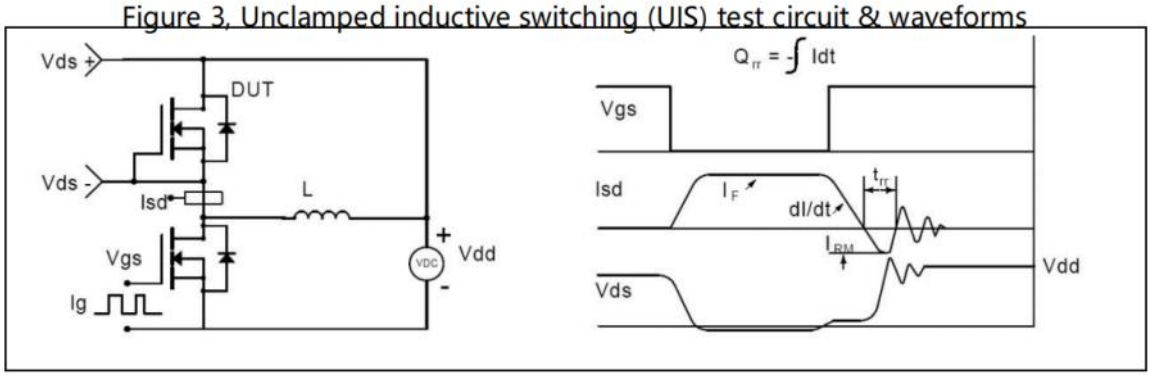

Figure 4, Diode reverse recovery test circuit & waveforms

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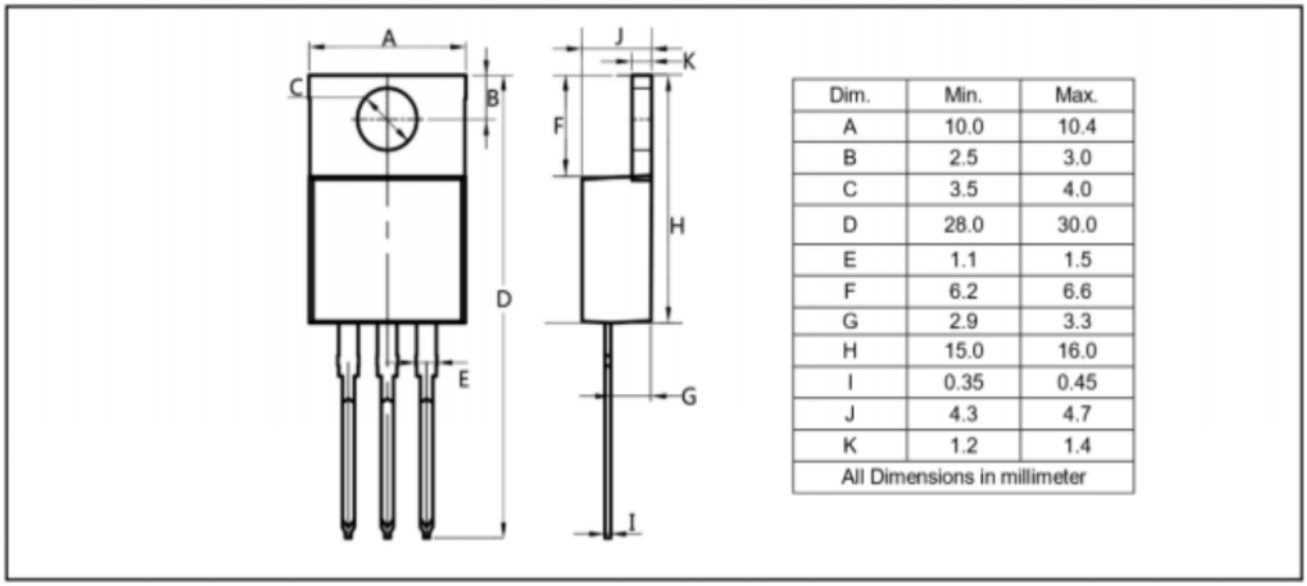
Package Mechanical Data-TO-220-3L



Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

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