

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



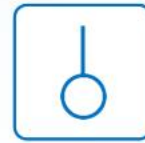
MOS



LDO



Diode



Sensor



DC-DC

Product Specification

▶ Domestic	Part Number	IRFR7740
▶ Overseas	Part Number	IRFR7740
▶ Equivalent	Part Number	IRFR7740

EV is the abbreviation of name EVVO

80V N-Channel Enhancement Mode MOSFET

General Description

IRFR7740 use advanced MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics.

This device is specially designed to get better ruggedness and suitable to use in

Applications

Consumer electronic power supply Motor control

Synchronous-rectification Isolated DC

Synchronous-rectification applications

General Features

$V_{DS} = 80V$ $I_D = 92A$

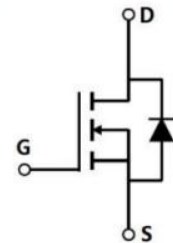
$R_{DS(ON)} < 7.5m\Omega @ V_{GS}=10V$

Low RDS(on) & FOM

Extremely low switching loss

Excellent stability and uniformity of Invertors

TO252-2L Pin Configuration



Absolute Maximum Ratings at $T_j=25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain source voltage	V _{DS}	80	V
Gate source voltage	V _{GS}	±20	V
Continuous drain current ¹⁾	I _D	92	A
Pulsed drain current ²⁾	I _{D, pulse}	400	A
Power dissipation ³⁾	P _D	148	W
Single pulsed avalanche energy ⁵⁾	EAS	205	mJ
Operation and storage temperature	T _{stg} , T _j	-55 to 150	°C
Thermal resistance, junction-case	R _{θJC}	0.84	°C/W
Thermal resistance, junction-ambient ⁴⁾	R _{θJA}	75	°C/W

80V N-Channel Enhancement Mode MOSFET
Electrical Characteristics at $T_j=25\text{ }^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-source breakdown voltage	BV_{DSS}	80	90		V	$V_{GS}=0\text{ V}$, $I_D=250\text{ }\mu\text{A}$
Gate threshold voltage	$V_{GS(th)}$	2		4	V	$V_{DS}=V_{GS}$, $I_D=250\text{ }\mu\text{A}$
Drain-source on-state resistance	$R_{DS(on)}$		6.5	7.5	m Ω	$V_{GS}=10\text{ V}$, $I_D=12\text{ A}$
Gate-source leakage current	I_{GSS}			100	nA	$V_{GS}=20\text{ V}$
				-100		$V_{GS}=-20\text{ V}$
Drain-source leakage current	I_{DSS}			1	μA	$V_{DS}=80\text{ V}$, $V_{GS}=0\text{ V}$
Input capacitance	C_{iss}		3600		pF	$V_{GS}=0\text{ V}$, $V_{DS}=40\text{ V}$, $f=100\text{ kHz}$
Output capacitance	C_{oss}		402		pF	
Reverse transfer capacitance	C_{rss}		366		pF	
Turn-on delay time	$t_{d(on)}$		22.0		ns	$V_{GS}=10\text{ V}$, $V_{DS}=50\text{ V}$, $R_G=2\text{ }\Omega$, $I_D=25\text{ A}$
Rise time	t_r		21.5		ns	
Turn-off delay time	$t_{d(off)}$		62.7		ns	
Fall time	t_f		61.4		ns	
Total gate charge	Q_g		52.6		nC	$I_D=25\text{ A}$, $V_{DS}=50\text{ V}$, $V_{GS}=10\text{ V}$
Gate-source charge	Q_{gs}		14.7		nC	
Gate-drain charge	Q_{gd}		7.5		nC	
Gate plateau voltage	$V_{plateau}$		3.8		V	
Diode forward current	I_S			100	A	$V_{GS}<V_{th}$
Pulsed source current	I_{SP}			300		
Diode forward voltage	V_{SD}			1.3	V	$I_S=12\text{ A}$, $V_{GS}=0\text{ V}$
Reverse recovery time	t_{rr}		75.0		ns	$I_S=25\text{ A}$, $di/dt=100\text{ A}/\mu\text{s}$
Reverse recovery charge	Q_{rr}		159.8		nC	
Peak reverse recovery current	I_{rrm}		3.4		A	

Note

- 1) Calculated continuous current based on maximum allowable junction temperature.
- 2) Repetitive rating; pulse width limited by max. junction temperature.
- 3) P_d 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 $T_a=25\text{ }^\circ\text{C}$.
- 5) $V_{DD}=50\text{ V}$, $R_G=25\text{ }\Omega$, $L=0.3\text{ mH}$, starting $T_j=25\text{ }^\circ\text{C}$.

80V N-Channel Enhancement Mode MOSFET

Electrical Characteristics Diagrams

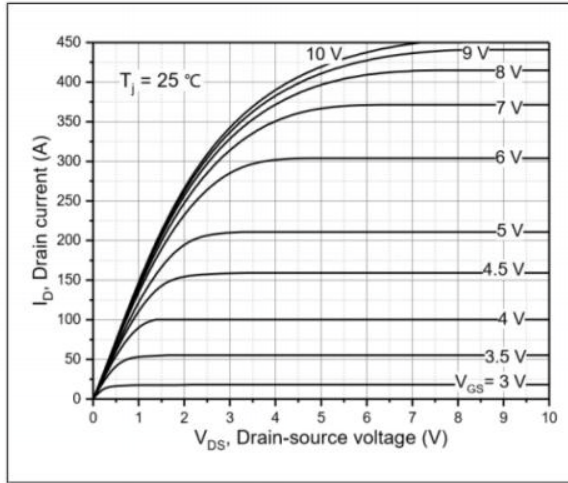


Figure 1, Typ. output characteristics

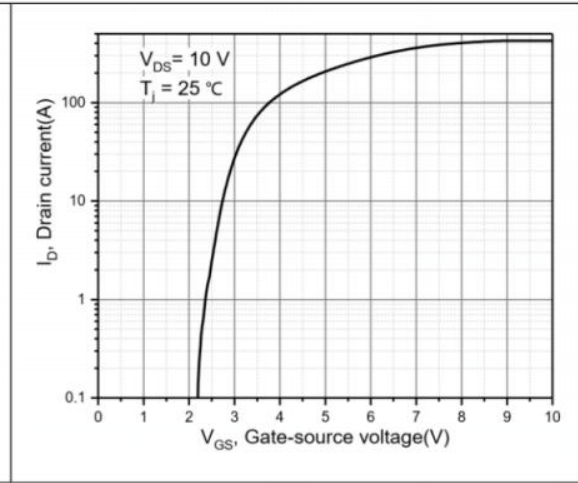


Figure 2, Typ. transfer characteristics

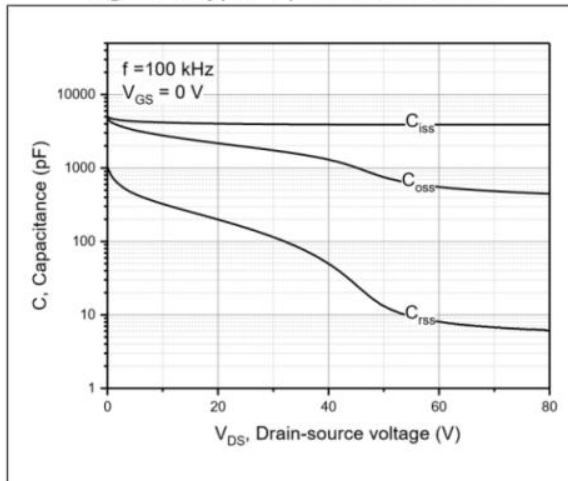


Figure 3, Typ. capacitances

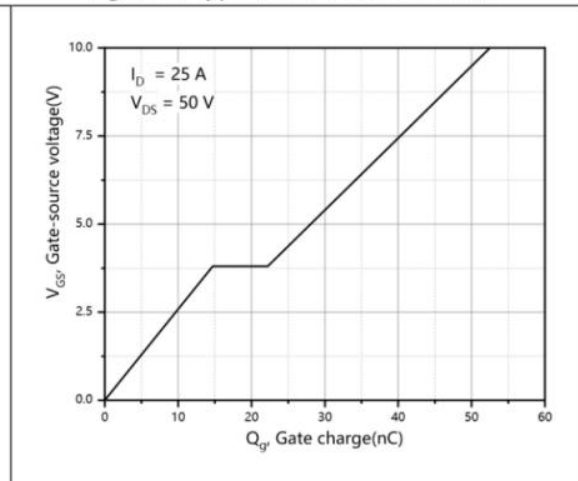


Figure 4, Typ. gate charge

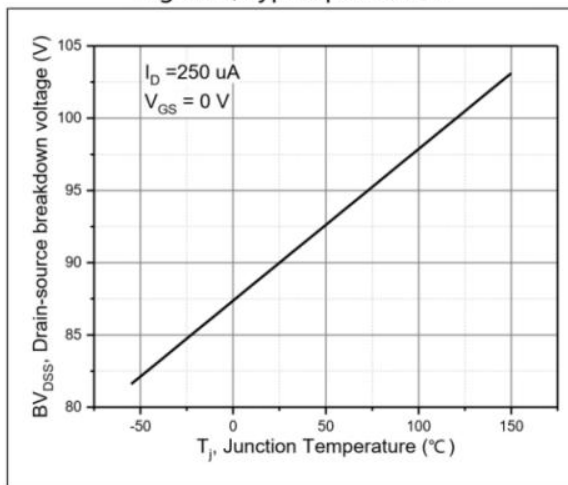


Figure 5, Drain-source breakdown voltage

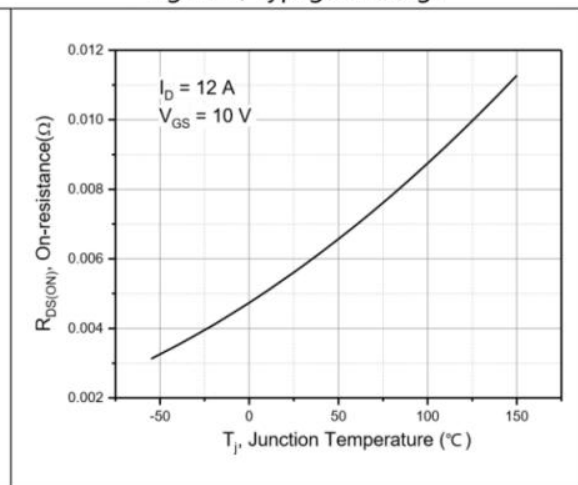


Figure 6, Drain-source on-state resistance

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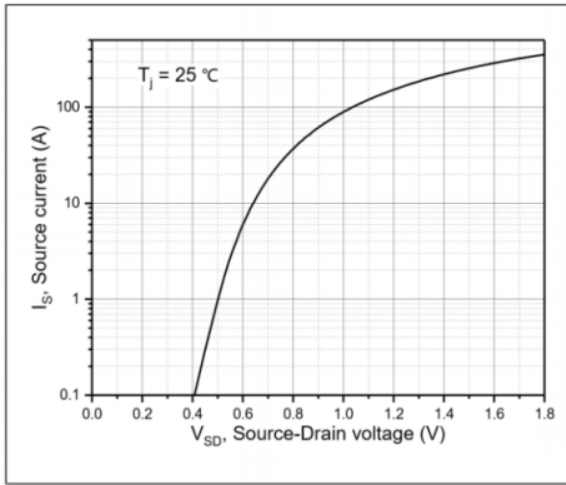


Figure 7, Forward characteristic of body diode

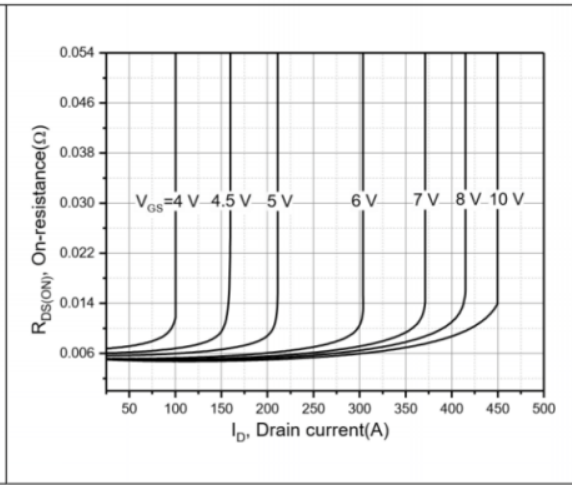


Figure 8, Drain-source on-state resistance

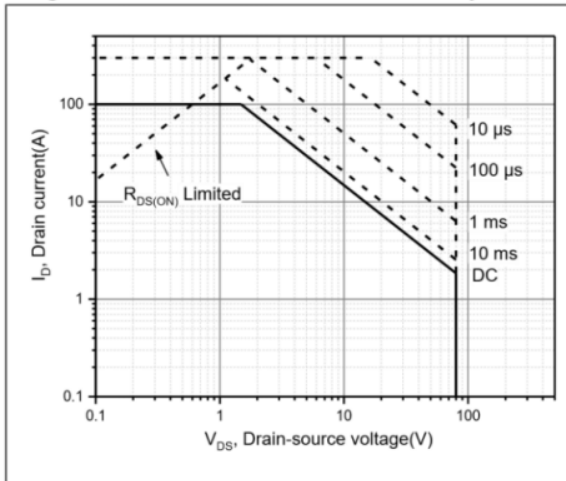


Figure 9, Safe operation area $T_C=25\text{ }^\circ\text{C}$

80V N-Channel Enhancement Mode MOSFET

Test circuits and waveforms

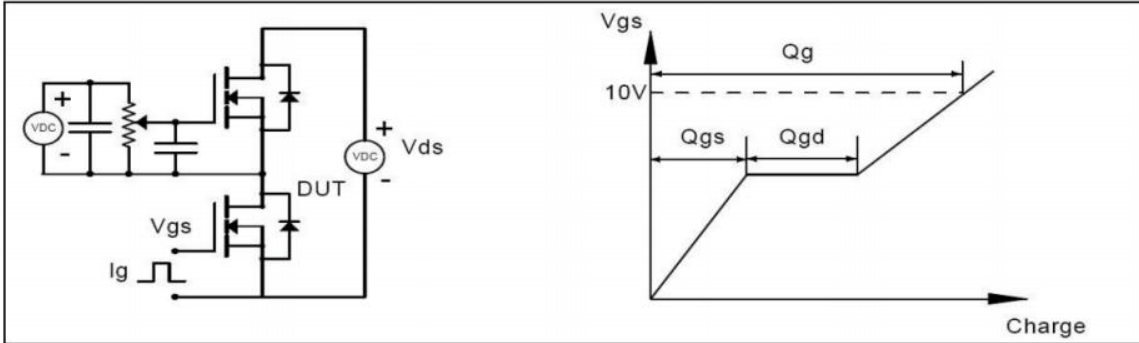


Figure 1, Gate charge test circuit & waveform

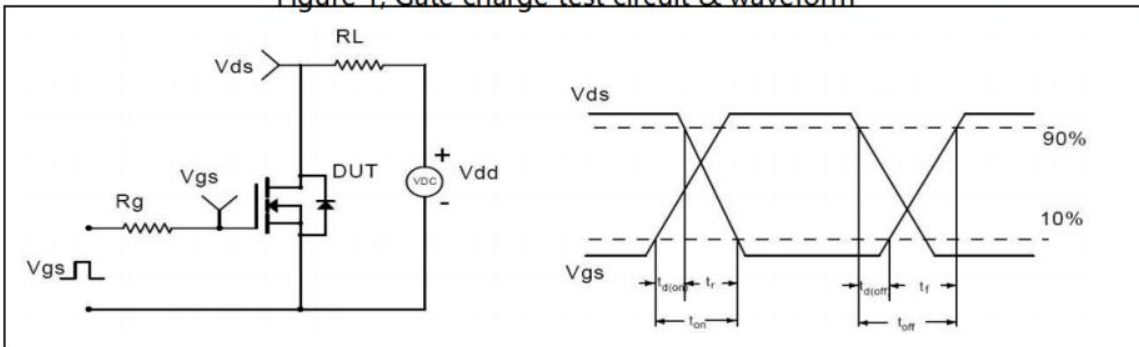


Figure 2, Switching time test circuit & waveforms

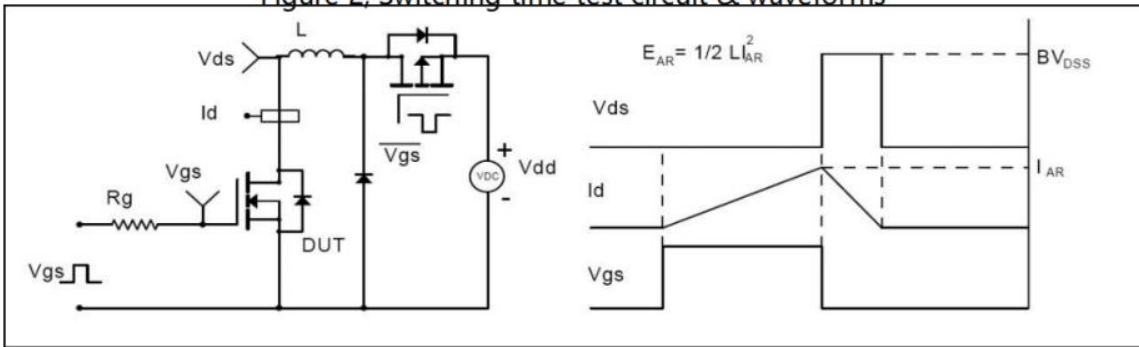


Figure 3, Unclamped inductive switching (UIS) test circuit & waveforms

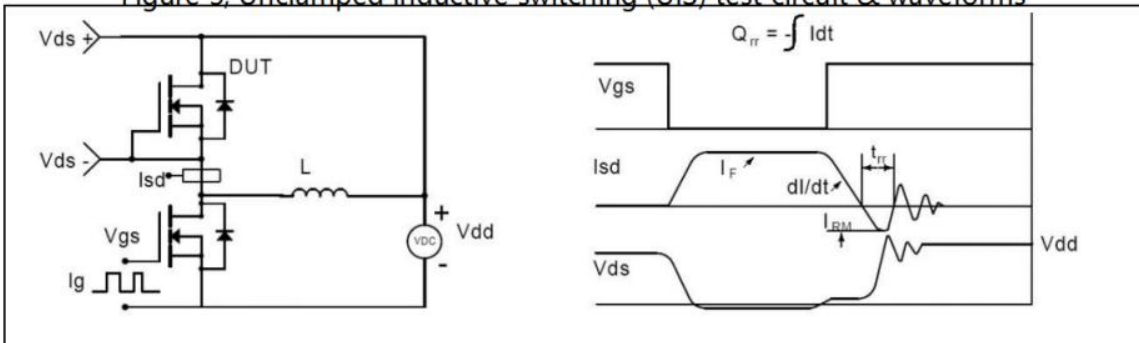
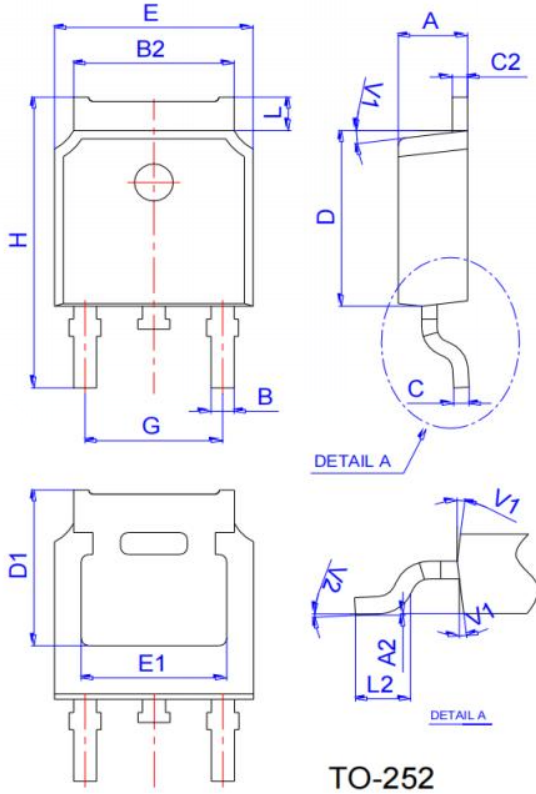


Figure 4, Diode reverse recovery test circuit & waveforms

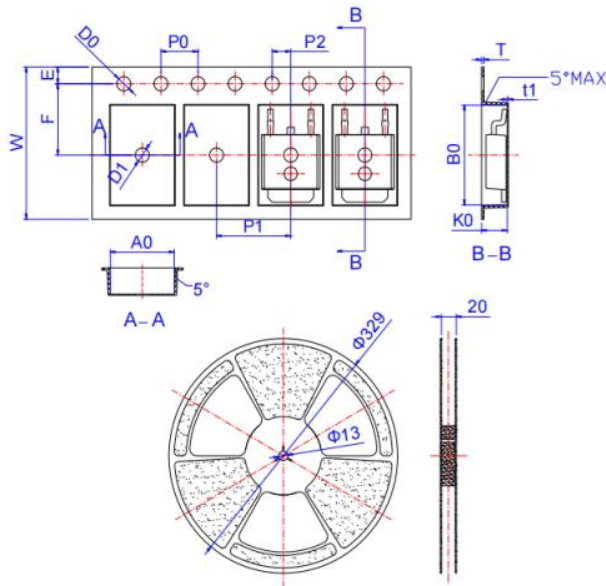
80V N-Channel Enhancement Mode MOSFET

Package Mechanical Data TO-252-2L



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Reel Specification-TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583

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