

EVVOSEMI[®]

THINK CHANGE DO



ESD



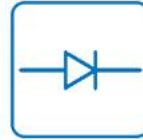
TVS



MOS



LDO



Diode



Sensor



DC-DC

Product Specification

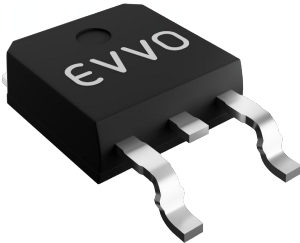
▶ Domestic	Part Number	IRFR3710Z
▶ Overseas	Part Number	IRFR3710Z
▶ Equivalent	Part Number	IRFR3710Z

EV is the abbreviation of name EVVO

Description

The IRFR3710Z series are from Advanced Power innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

TO-252-2L Pin Configuration



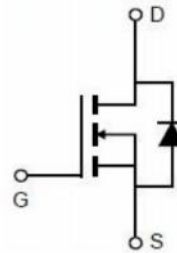
100V N-Channel Enhancement Mode MOSFET

General Features

$V_{DS} = 100V$ $I_D = 50A$
 $R_{DS(ON)} < 20 \text{ m}\Omega @ V_{GS}=10V$
 $R_{DS(ON)} < 27 \text{ m}\Omega @ V_{GS}=4.5V$

Application

Battery protection
 Load switch
 Uninterruptible power supply



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

Parameter	Symbol	Value	Unit
Drain source voltage	V_{DS}	100	V
Gate source voltage	V_{GS}	± 20	V
Continuous drain current ¹⁾ , $T_C=25^\circ\text{C}$	I_D	50	A
Pulsed drain current ²⁾ , $T_C=25^\circ\text{C}$	$I_D, \text{ pulse}$	120	A
Power dissipation ³⁾ , $T_C=25^\circ\text{C}$	P_D	72	W
Single pulsed avalanche energy ⁵⁾	EAS	30	mJ
Operation and storage temperature	Tstg, T_j	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-case	$R_{\theta JC}$	1.74	$^\circ\text{C/W}$
Thermal resistance, junction-ambient ⁴⁾	$R_{\theta JA}$	62	$^\circ\text{C/W}$

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Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0 V, I _D =250 μA	100			V
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250 μA	1.0		2.5	V
Drain-source on-state resistance	R _{DS(ON)}	V _{GS} =10 V, I _D =8 A		16	20	mΩ
Drain-source on-state resistance	R _{DS(ON)}	V _{GS} =4.5 V, I _D =6 A		18	27	mΩ
Gate-source leakage current	I _{GSS}	V _{GS} =20 V			100	nA
					-100	
Drain-source leakage current	I _{DSS}	V _{DS} =100 V, V _{GS} =0 V			1	μA
Input capacitance	C _{iss}	V _{GS} =0 V, V _{DS} =50 V, f=1 MHz		1190.6		pF
Output capacitance	C _{oss}			194.6		pF
Reverse transfer capacitance	C _{rss}			4.1		pF
Turn-on delay time	t _{d(on)}	V _{GS} =10 V, V _{DS} =50 V, R _G =2.2 Ω, I _D =10 A		17.8		ns
Rise time	t _r			3.9		ns
Turn-off delay time	t _{d(off)}			33.5		ns
Fall time	t _f			3.2		ns
Total gate charge	Q _g	I _D =8 A, V _{DS} =50 V, V _{GS} =10 V		19.8		nC
Gate-source charge	Q _{gs}			2.4		nC
Gate-drain charge	Q _{gd}			5.3		nC
Gate plateau voltage	V _{plateau}			3.2		V
Diode forward current	I _S	V _{GS} <V _{th}			40	A
Pulsed source current	I _{SP}				120	A
Diode forward voltage	V _{SD}	I _S =8 A, V _{GS} =0 V			1.3	V
Reverse recovery time	t _{rr}	I _S =8 A, di/dt=100 A/μs		50.2		ns
Reverse recovery charge	Q _{rr}			95.1		nC
Peak reverse recovery current	I _{rrm}			2.5		A

- 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_{θJA} 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, R_G=25 Ω, L=0.3 mH, starting T_J=25 °C.

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Electrical Characteristics Diagrams

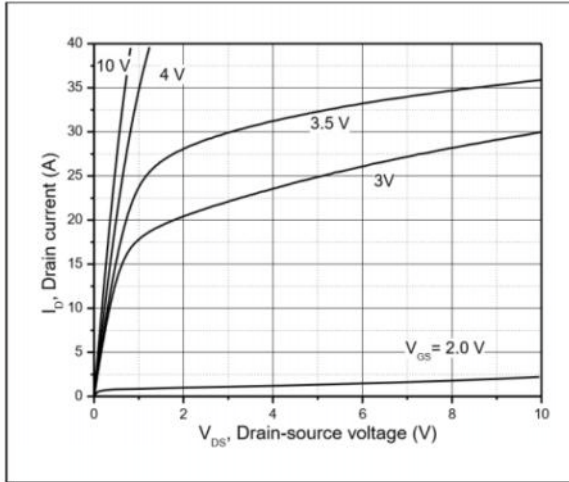


Figure 1, Typ. output characteristics

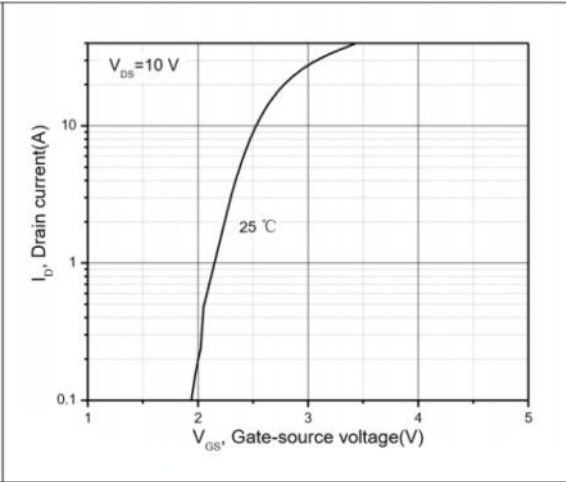


Figure 2, Typ. transfer characteristics

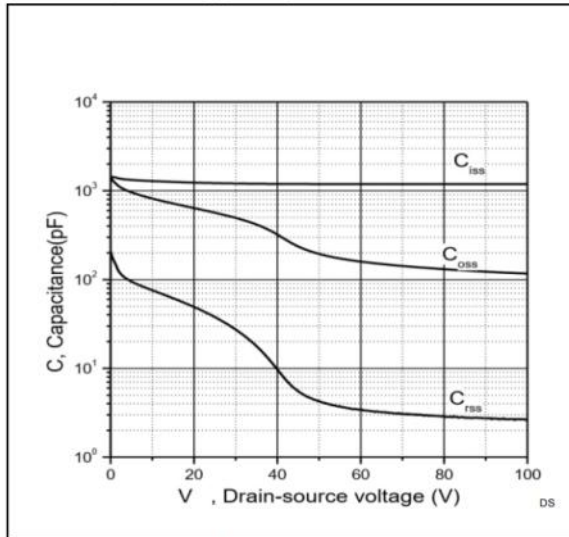


Figure 3, Typ. capacitances

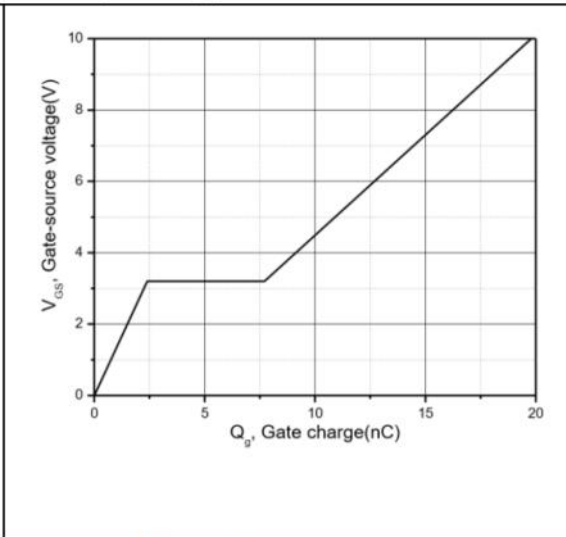


Figure 4, Typ. gate charge

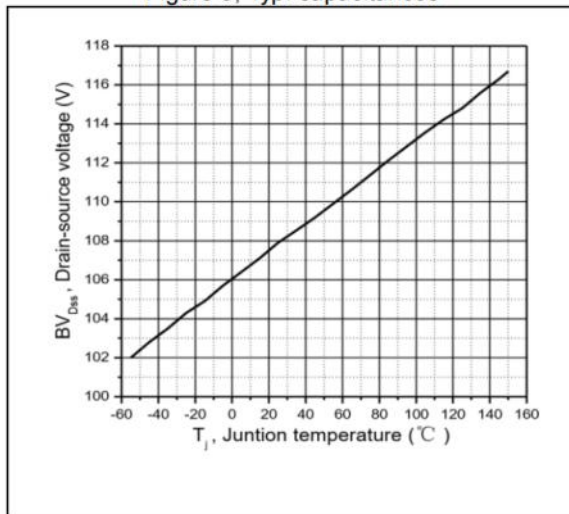


Figure 5, Drain-source breakdown voltage

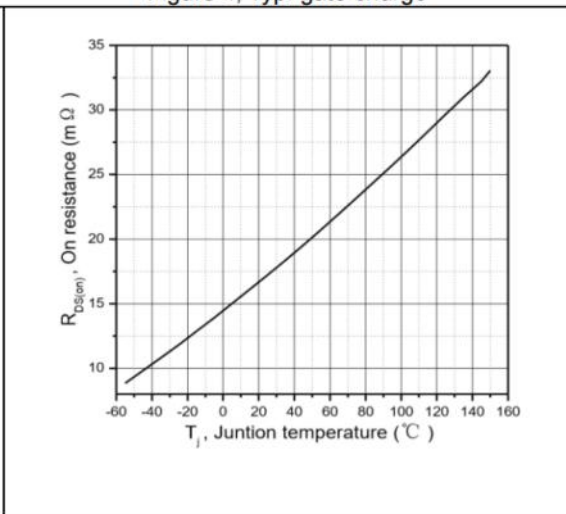


Figure 6, Drain-source on-state resistance

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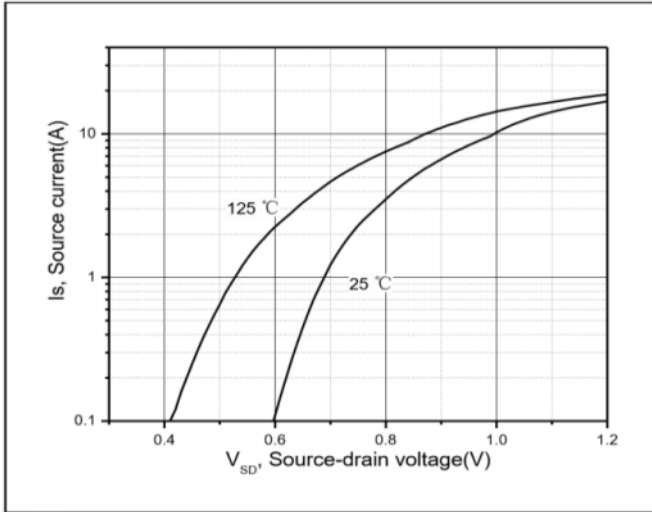


Figure 7, Forward characteristic of body diode

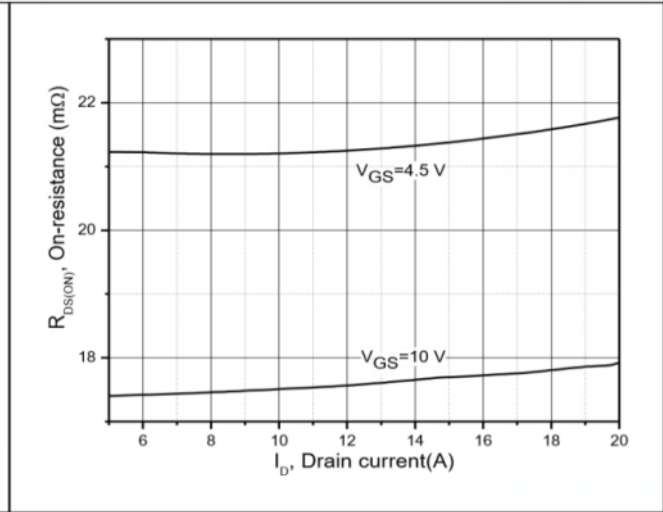


Figure 8, Drain-source on-state resistance

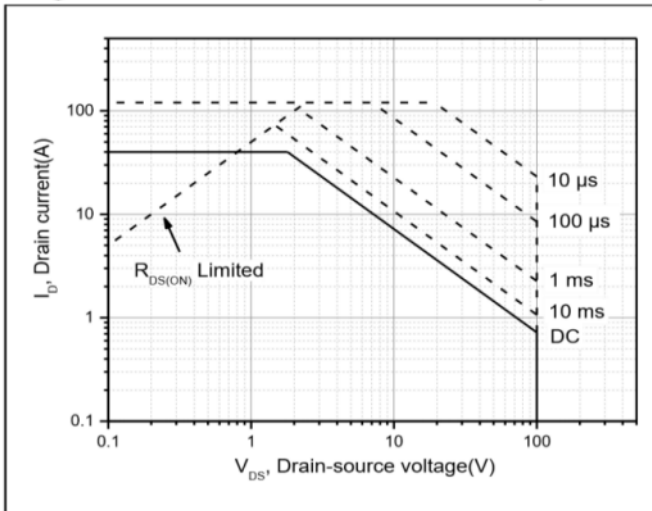


Figure 9, Safe operation area $T_C=25\text{ }^{\circ}\text{C}$

100V N-Channel Enhancement Mode MOSFET

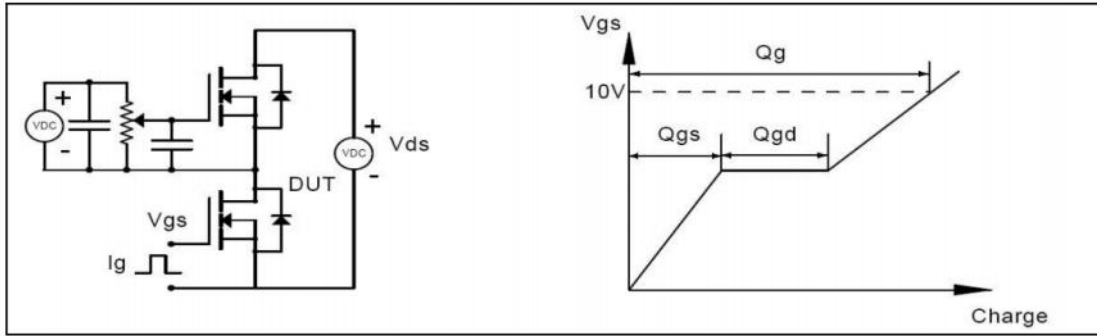


Figure 1, Gate charge test circuit & waveform

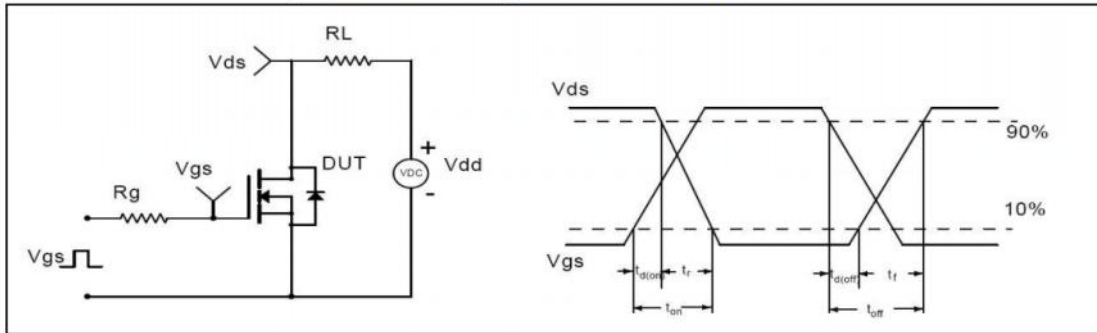


Figure 2, Switching time test circuit & waveforms

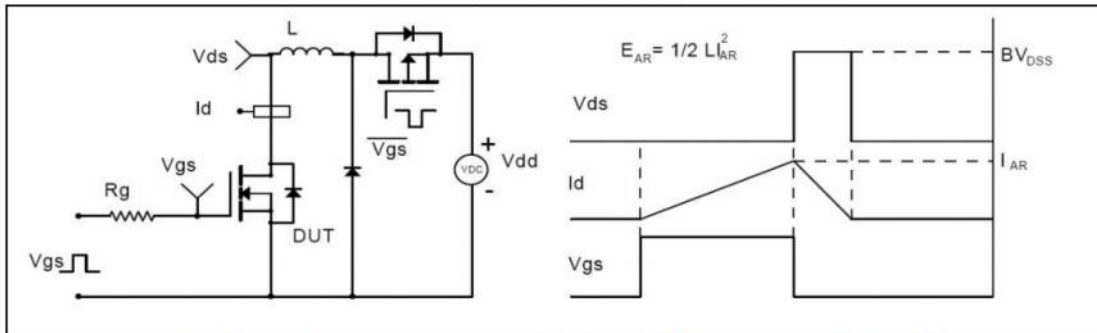


Figure 3, Unclamped inductive switching (UIS) test circuit & waveforms

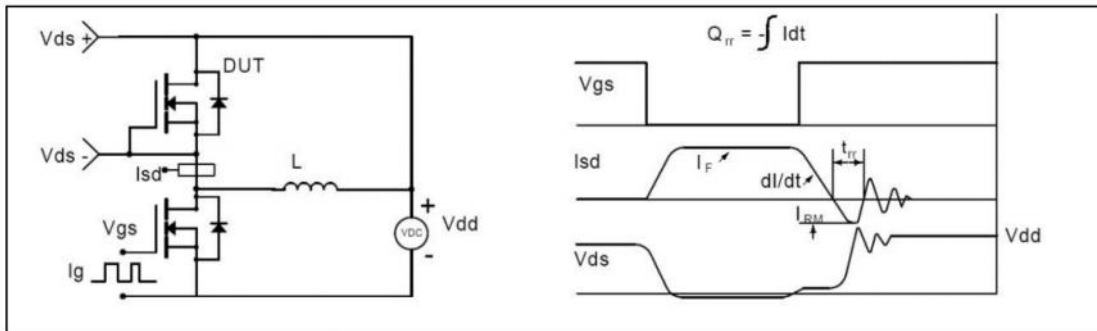
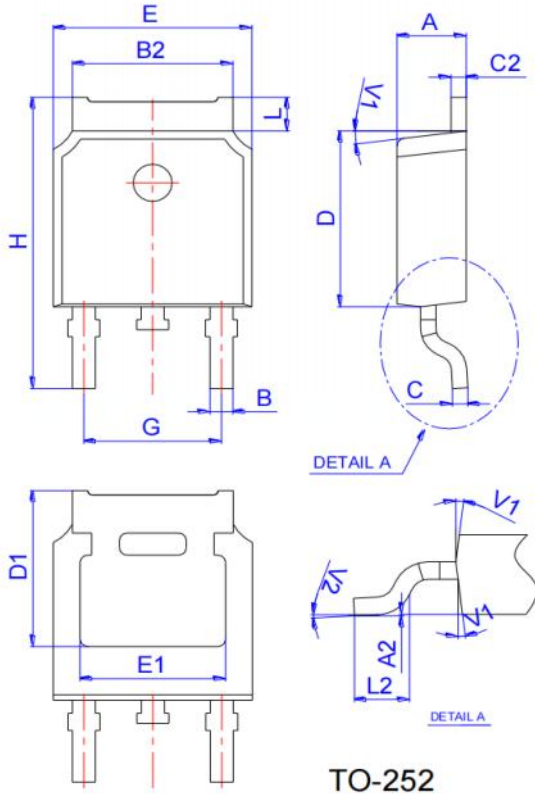


Figure 4, Diode reverse recovery test circuit & waveforms

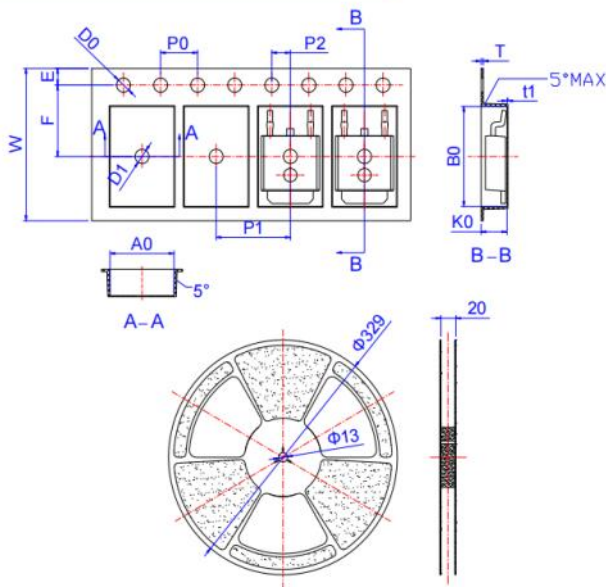
100V N-Channel Enhancement Mode MOSFET

Package Mechanical Data



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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