

EVVOSEMI[®]

THINK CHANGE DO



ESD



TVS



MOS



LDO



Diode



Sensor



DC-DC

Product Specification

▶ Domestic	Part Number	IRLR8726
▶ Overseas	Part Number	IRLR8726
▶ Equivalent	Part Number	IRLR8726

EV is the abbreviation of name EVVO

Features

- $V_{DS}(V)=30V$
- $R_{DS(ON)} < 5.8m\Omega$ ($V_{GS} = 10V$)
- $R_{DS(ON)} < 8 m\Omega$ ($V_{GS} = 4.5V$)

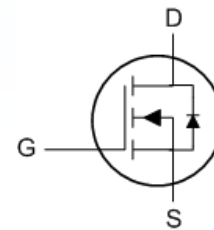
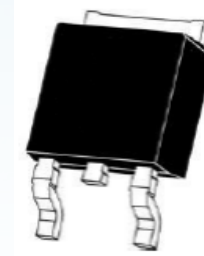
Applications

- High Frequency Synchronous Buck Converters for Computer Processor Power
- High Frequency Isolated DC-DC Converters with Synchronous Rectification for Telecom and Industrial Use

Benefits

- Very Low $R_{DS(on)}$ at 4.5V V_{GS}
- Ultra-Low Gate Impedance
- Fully Characterized Avalanche Voltage and Current

N-Channel MOSFET



Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain-to-Source Voltage	30	V
V_{GS}	Gate-to-Source Voltage	± 20	
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	86④	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	61④	
I_{DM}	Pulsed Drain Current ①	340	
$P_D @ T_C = 25^\circ C$	Maximum Power Dissipation ⑥	75	W
$P_D @ T_C = 100^\circ C$	Maximum Power Dissipation ⑥	38	
	Linear Derating Factor	0.5	W/°C
T_J	Operating Junction and	-55 to + 175	°C
T_{STG}	Storage Temperature Range		
	Soldering Temperature, for 10 seconds		

Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case ⑥		2.0	°C/W
$R_{\theta JA}$	Junction-to-Ambient (PCB Mount) ⑤		50	
$R_{\theta JA}$	Junction-to-Ambient		110	

Notes

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ C$, $L = 0.605mH$, $R_G = 25\Omega$, $I_{AS} = 20A$.
- ③ Pulse width $\leq 400\mu s$; duty cycle $\leq 2\%$.
- ④ Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 50A.
- ⑤ When mounted on 1" square PCB (FR-4 or G-10 Material). For recommended footprint and soldering techniques refer to application note #AN-994.
- ⑥ R_θ is measured at T_J approximately at $90^\circ C$

N-Channel MOSFET

Static @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

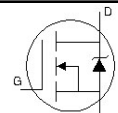
	Parameter	Min.	Typ.	Max.	Units	Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	30			V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient		20		mV/ $^\circ\text{C}$	Reference to 25°C , $I_D = 1\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance		4.0	5.8	$m\Omega$	$V_{GS} = 10V, I_D = 25A$ ③ $V_{GS} = 4.5V, I_D = 20A$ ③
$V_{GS(th)}$	Gate Threshold Voltage	1.35	1.80	2.35	V	$V_{DS} = V_{GS}, I_D = 50\mu A$
$\Delta V_{GS(th)}/\Delta T_J$	Gate Threshold Voltage Coefficient		-8.6		mV/ $^\circ\text{C}$	
I_{DSS}	Drain-to-Source Leakage Current			1.0	μA	$V_{DS} = 24V, V_{GS} = 0V$ $V_{DS} = 24V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage			100	nA	$V_{GS} = 20V$
	Gate-to-Source Reverse Leakage			-100	nA	$V_{GS} = -20V$
g_{fs}	Forward Transconductance	73			S	$V_{DS} = 15V, I_D = 20A$
Q_g	Total Gate Charge		15	23		$V_{DS} = 15V$ $V_{GS} = 4.5V$ $I_D = 20A$ See Fig. 15
Q_{gs1}	Pre-V _{th} Gate-to-Source Charge		3.7		nC	
Q_{gs2}	Post-V _{th} Gate-to-Source Charge		1.9		nC	
Q_{gd}	Gate-to-Drain Charge		5.7		nC	
Q_{gdr}	Gate Charge Overdrive		3.7		nC	
Q_{sw}	Switch Charge ($Q_{gs2} + Q_{gd}$)		7.6		nC	
Q_{oss}	Output Charge		10		nC	$V_{DS} = 15V, V_{GS} = 0V$
R_G	Gate Resistance		2.0	3.5	Ω	
$t_{d(on)}$	Turn-On Delay Time		12		ns	$V_{DD} = 15V, V_{GS} = 4.5V$ ③ $I_D = 20A$ $R_G = 1.8\Omega$ See Fig. 13
t_r	Rise Time		49			
$t_{d(off)}$	Turn-Off Delay Time		15			
t_f	Fall Time		16			
C_{iss}	Input Capacitance		2150		pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance		480			$V_{DS} = 15V$
C_{rss}	Reverse Transfer Capacitance		205			$f = 1.0\text{MHz}$

Avalanche Characteristics

	Parameter	Typ.	Max.	Units
E_{AS}	Single Pulse Avalanche Energy ②		120	mJ
I_{AR}	Avalanche Current ①		20	A

Diode Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)			86 ④	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①			340	A	
V_{SD}	Diode Forward Voltage			1.0	V	$T_J = 25^\circ\text{C}, I_S = 20A, V_{GS} = 0V$ ③
t_{rr}	Reverse Recovery Time		24	36	ns	$T_J = 25^\circ\text{C}, I_F = 20A, V_{DD} = 15V$
Q_{rr}	Reverse Recovery Charge		52	78	nC	$di/dt = 300A/\mu s$ ③



N-Channel MOSFET

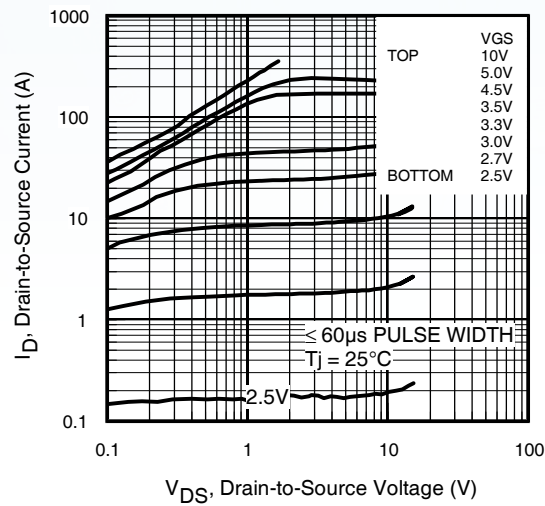


Fig 1. Typical Output Characteristics

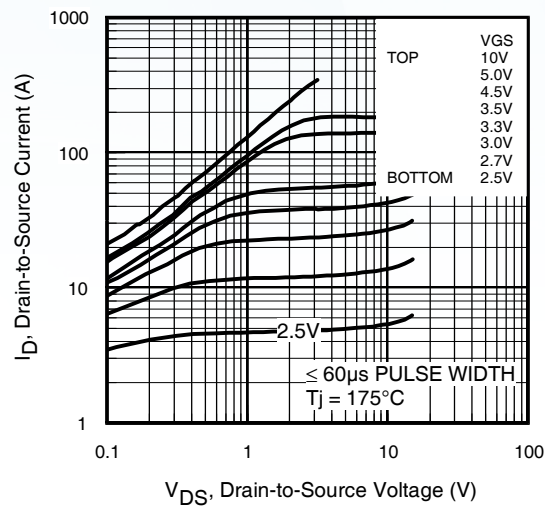


Fig 2. Typical Output Characteristics

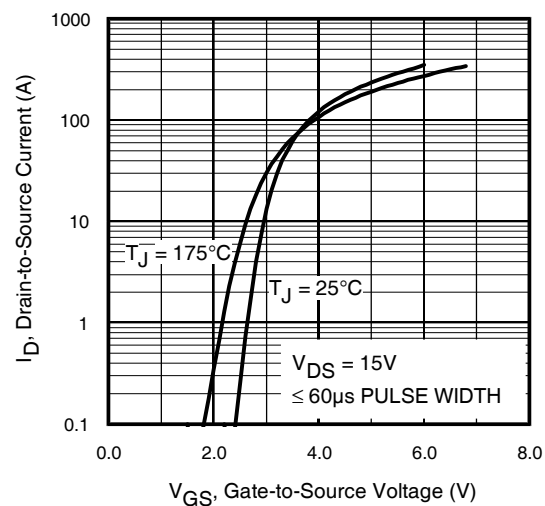


Fig 3. Typical Transfer Characteristics

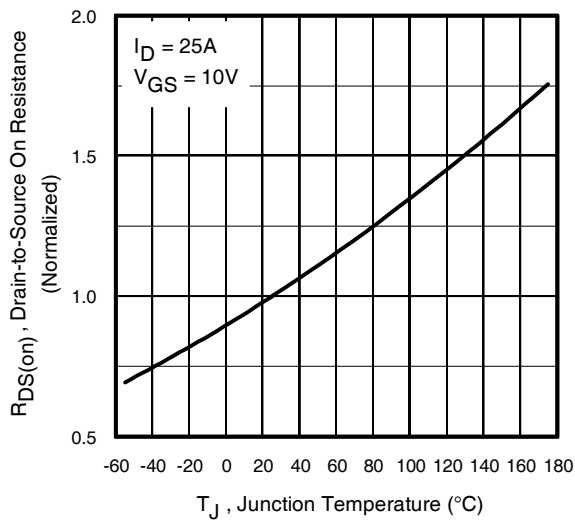


Fig 4. Normalized On-Resistance vs. Temperature

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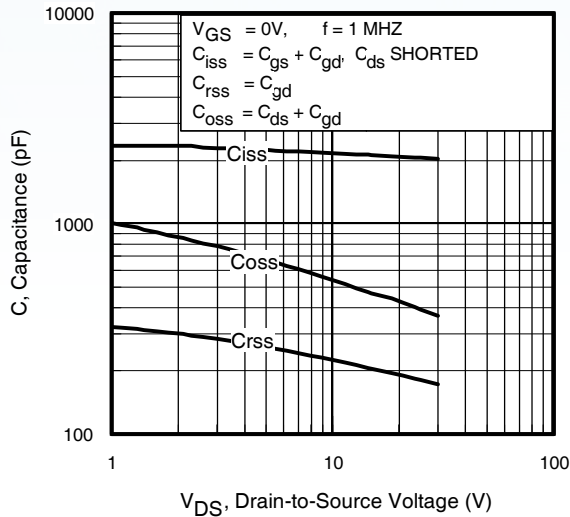


Fig 5. Typical Capacitance vs. Drain-to-Source Voltage

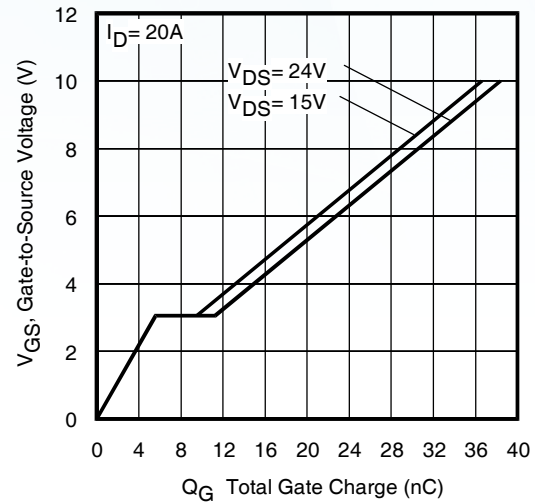


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

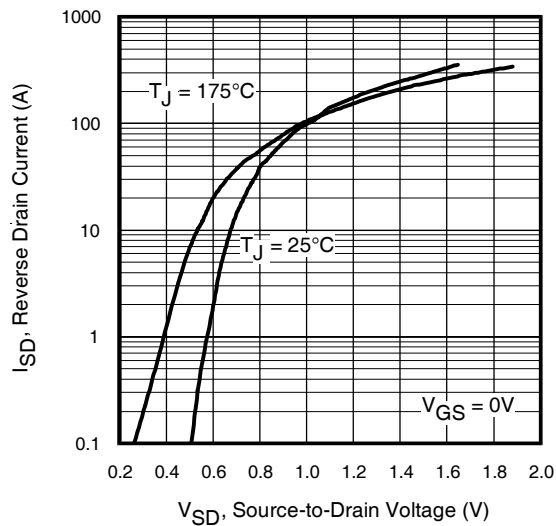


Fig 7. Typical Source-Drain Diode Forward Voltage

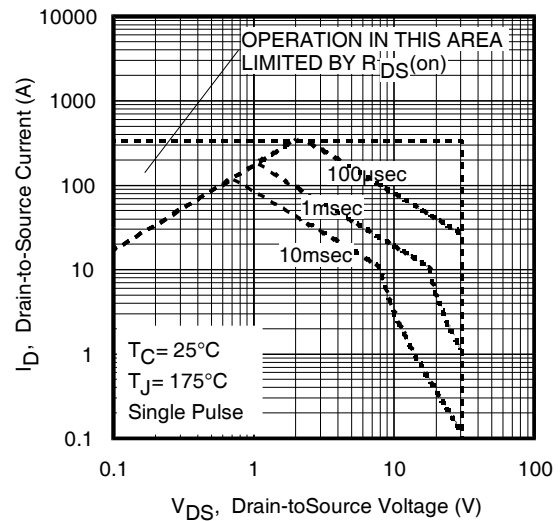


Fig 8. Maximum Safe Operating Area

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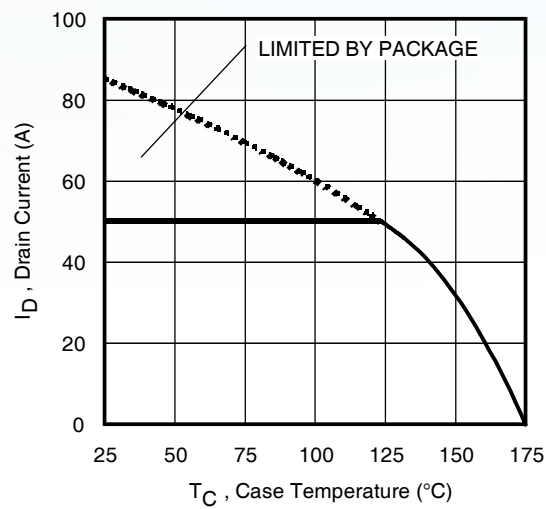


Fig 9. Maximum Drain Current vs. Case Temperature

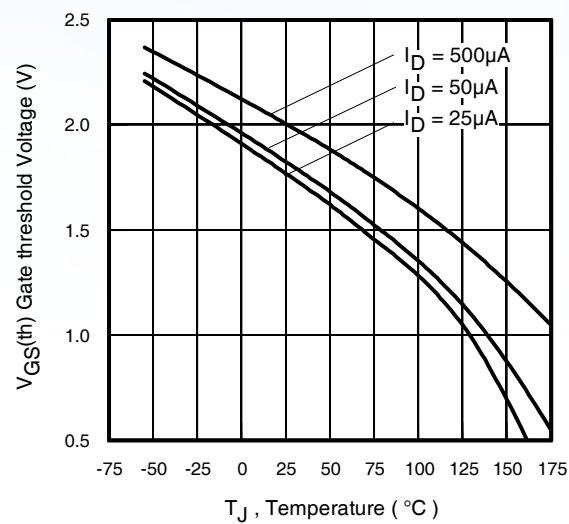


Fig 10. Threshold Voltage vs. Temperature

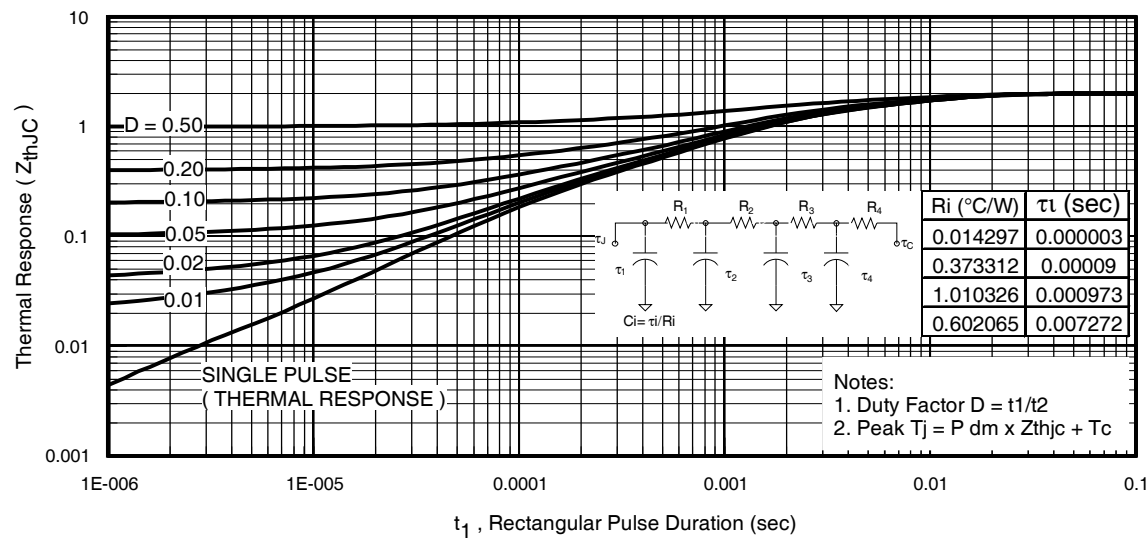


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

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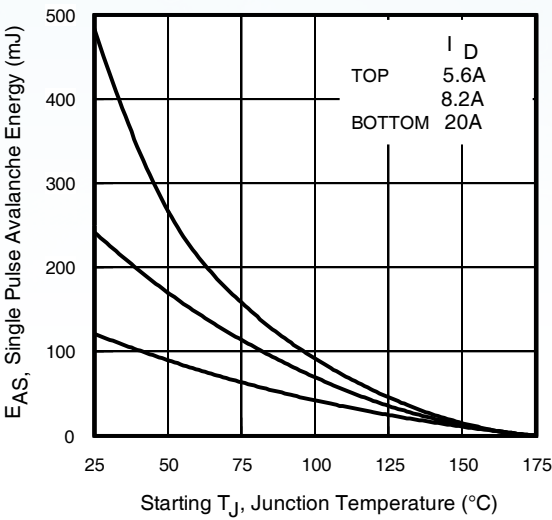


Fig 12a. Maximum Avalanche Energy Vs. Drain Current

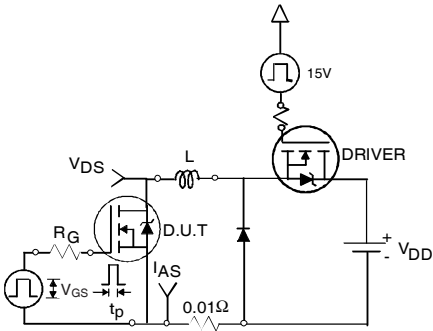


Fig 12b. Unclamped Inductive Test Circuit

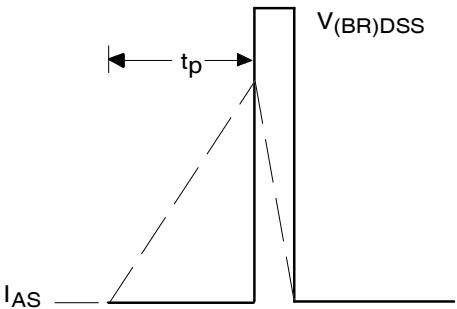


Fig 12c. Unclamped Inductive Waveforms

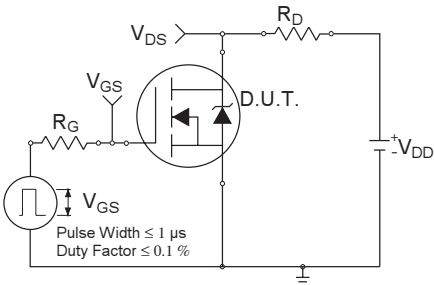


Fig 13a. Switching Time Test Circuit

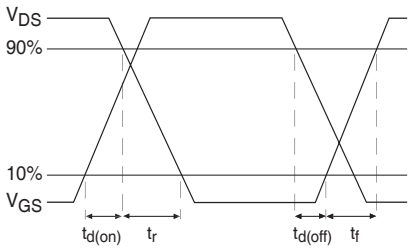
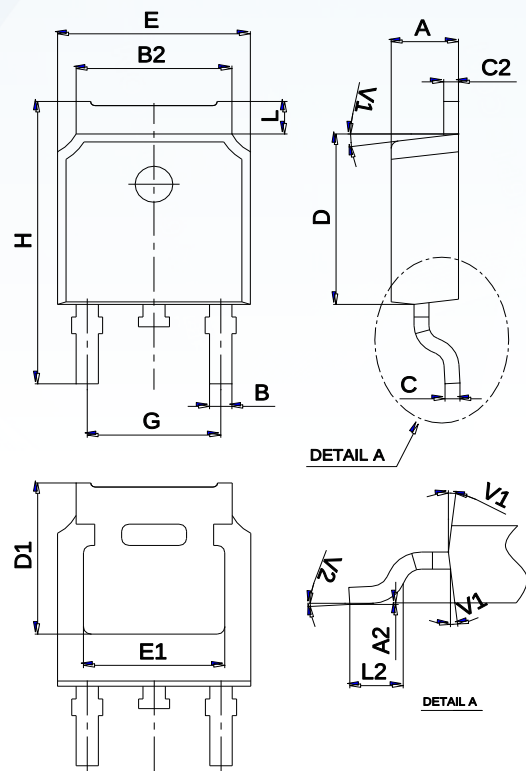


Fig 13b. Switching Time Waveforms

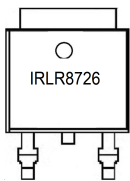
N-Channel MOSFET

Package Mechanical Data TO-252



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°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
IRLR8726	TO-252	2500	Tape and reel

Disclaimer

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