UMW FDS3672

100V N-Channel MOSFET

1.Features

- I_D=7.5A
- $R_{DS(ON)}$=23mΩ(V_{GS}=10V)
- Q_g(tot) = 28nC(Typ.),V_{GS}=10V
- Low Miller Charge
- Low Q_{rr} Body Diode
- Optimized efficiency at high frequencies
- UIS Capability (Single Pulse and Repetitive Pulse)

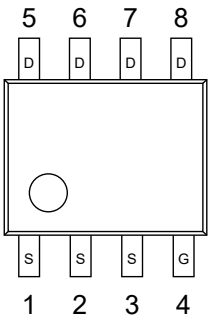
2.Applications

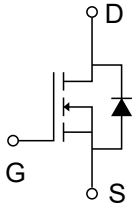
- DC/DC converters and Off-Line UPS
- Distributed Power Architectures and VRMs
- Primary Switch for 24V and 48V Systems
- High Voltage Synchronous Rectifier

3.Pinning information

Pin	Symbol	Description
4	G	GATE
1,2,3	S	SOURCE
5,6,7,8	D	DRAIN

SOP-8





4.Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DSS}	100	V
Gate-Source Voltage	V_{GS}	±20	
Drain Current Continuous (T_A=25°C, V_{GS}=10V, $R_{\theta JA}$=50°C/W)	I_D	7.5	A
Continuous (T_A=100°C, V_{GS}=10V, $R_{\theta JA}$=50°C/W)		4.8	
Pulsed		Figure 4	
Single Pulse Avalanche Energy (Note 1)	E_{AS}	416	mJ
Power Dissipation	P_D	2.5	W
Derate above 25°C		20	mW/°C
Storage Temperature	T_J,T_{STG}	-55 to 150	°C

5.Thermal Characteristics

Parameter	Symbol	Rating	Units
Thermal Resistance, Junction to Ambient at 10 seconds (Note 3)	$R_{\theta JA}$	50	°C/W
Thermal Resistance, Junction to Ambient at 1000 seconds (Note 3)	$R_{\theta JA}$	85	°C/W
Thermal Resistance, Junction to Case (Note 2)	$R_{\theta JC}$	25	°C/W

6.Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	100			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=80V, V_{GS}=0V			1	μA
		T_C=150°C			250	
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±20V			±100	nA
On Characteristics						
Gate to Source Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2		4	V
Drain to Source On Resistance	$R_{DS(ON)}$	I_D=7.5A, V_{GS}=10V		19	23	A
		I_D=6.8A, V_{GS}=4.5V		24	28	mΩ
		I_D=7.5A, V_{GS}=10V		35	43	mΩ
		T_C=150°C				mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=25V		2015		pF
Output Capacitance	C_{oss}	V_{GS}=0V		285		pF
Reverse Transfer Capacitance	C_{rss}	f=1MHz		70		pF
Total Gate Charge at 10V	Q_g(TOT)	V_{GS}=0V to 10V		28	37	nC
Threshold Gate Charge	Q_g(TH)	V_{GS}=0V to 2V		4	6	nC
Gate to Source Gate Charge	Q_{gs}	V_{DD}=50V		10		nC
Gate Charge Threshold to Plateau	Q_{gs2}	I_D=7.5A		6.8		nC
Gate to Drain “Miller” Charge	Q_{gd}	I_G=1mA		6		nC
Switching Characteristics (V_{GS}=10V)						
Turn-On Time	t_{ON}				51	ns
Turn-On Delay Time	$t_{D(on)}$			14		ns
Rise Time	t_r	V_{DD}=50V, I_D=4A		20		ns
Turn-Off Delay Time	$t_{D(off)}$	V_{GS}=10V, R_{GS}=10Ω		37		ns
Fall Time	t_f			27		ns
Turn-Off Time	t_{OFF}				96	ns

Drain-Source Diode Characteristics						
Source to Drain Diode Voltage	V_{SD}	I_{SD}=7.5A			1.25	V
		I_{SD}=4A			1	V
Reverse Recovery Time	t_{rr}	I_{SD}=7.5A, dI_{SD}/dt=100A/μs			55	ns
Reverse Recovered Charge	Q_{rr}	I_{SD}=7.5A, dI_{SD}/dt=100A/μs			90	nC

Notes:

1: Starting T_J=25°C, L=13mH, I_{AS}= 8A.

2: $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design.

3: $R_{\theta JA}$ is measured with 1.0 in2 copper on FR-4 board

7.1TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

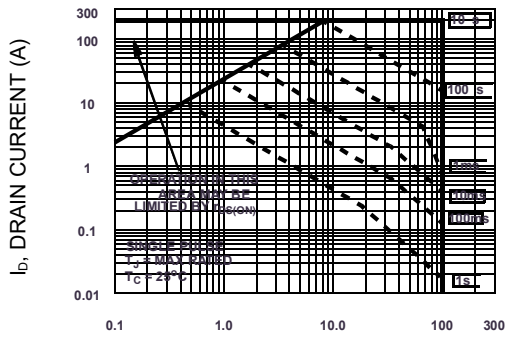


Fig 1: Forward Bias Safe Operating Area

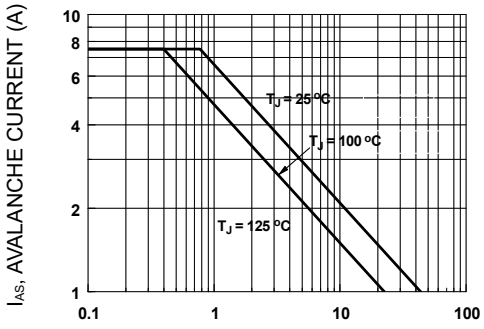


Figure 2: Unclamped Inductive Switching Capability

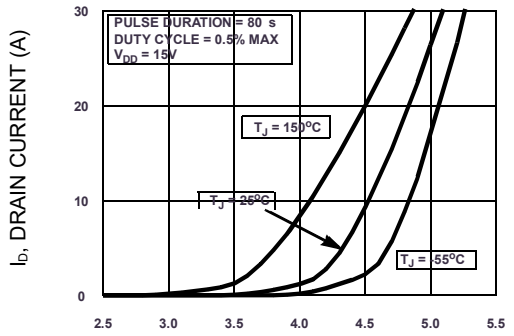


Figure 3: Transfer Characteristics

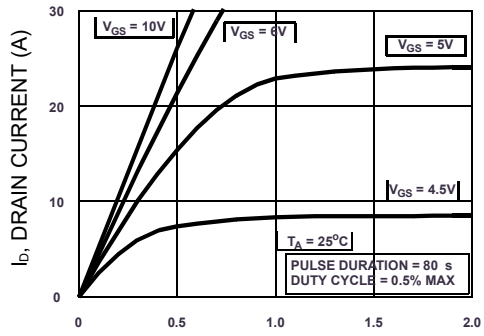


Figure 4: Saturation Characteristics

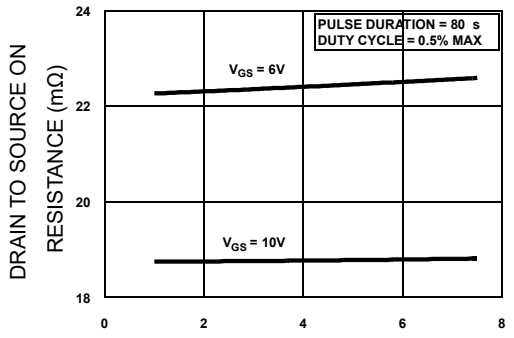


Figure 5: Drain to Source On Resistance vs Drain Current

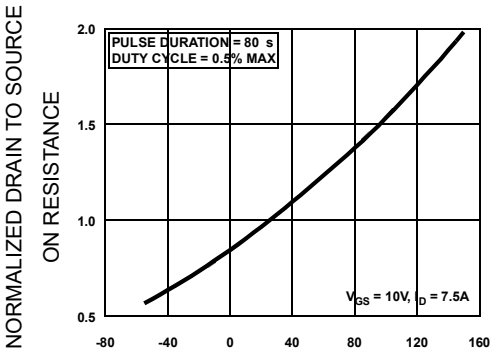
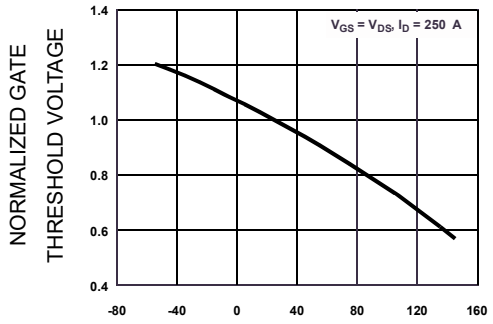


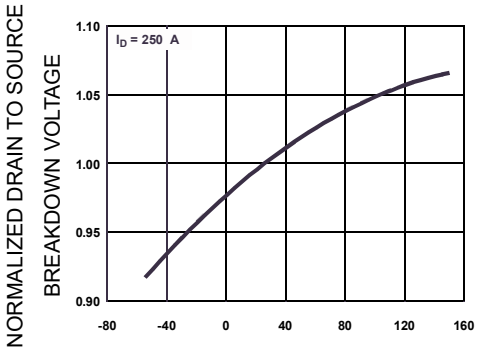
Figure 6: Normalized Drain to Source On Resistance vs Junction Temperature

7.2TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



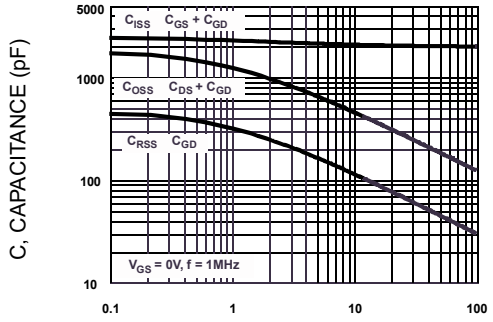
T_J, JUNCTION TEMPERATURE (°C)

Figure 6: Normalized Drain to Source On Resistance vs Junction Temperature



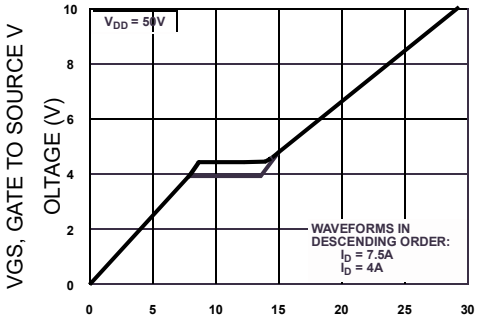
T_J, JUNCTION TEMPERATURE (°C)

Figure 2: Normalized Drain to Source Breakdown Voltage vs Junction Temperature



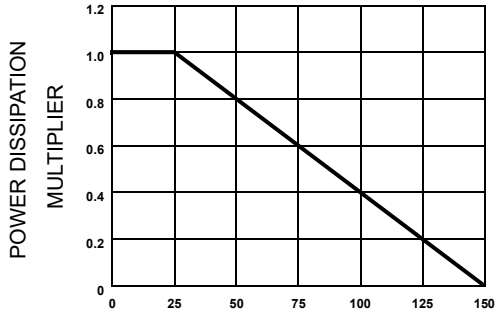
V_{DS}, DRAIN TO SOURCE VOLTAGE (V)

Figure 3: Capacitance vs Drain to Source Voltage



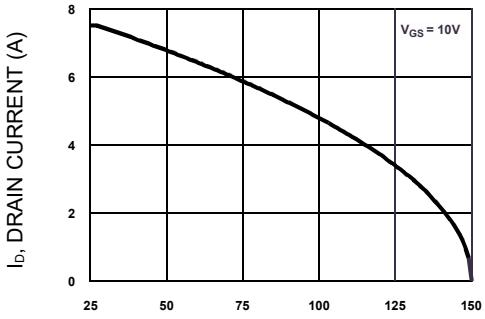
Q_g, GATE CHARGE (nC)

Figure 4: Gate Charge Waveforms for Constant Gate Currents



T_A, AMBIENT TEMPERATURE (°C)

Figure 5: Normalized Power Dissipation vs Ambient Temperature



T_C, CASE TEMPERATURE (°C)

Figure 6: Maximum Continuous Drain Current vs Case Temperature

7.3TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

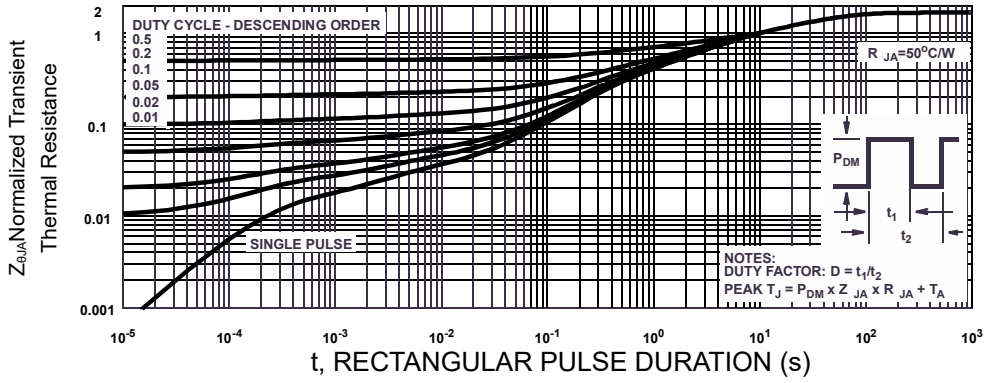


Figure 12: Normalized Maximum Transient Thermal Impedance

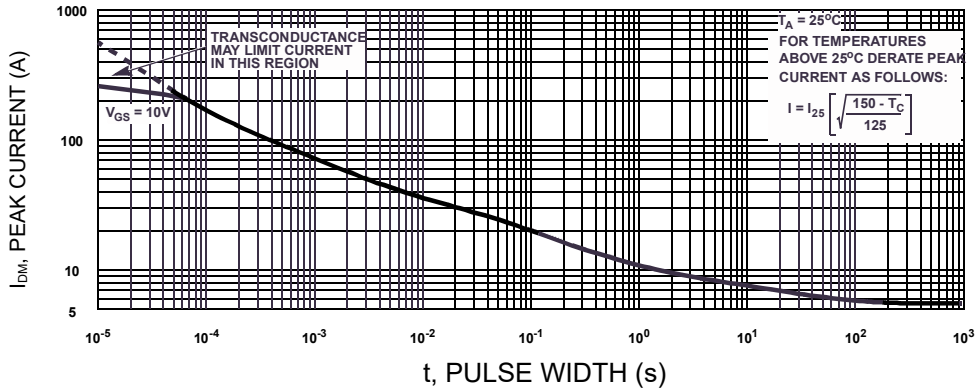
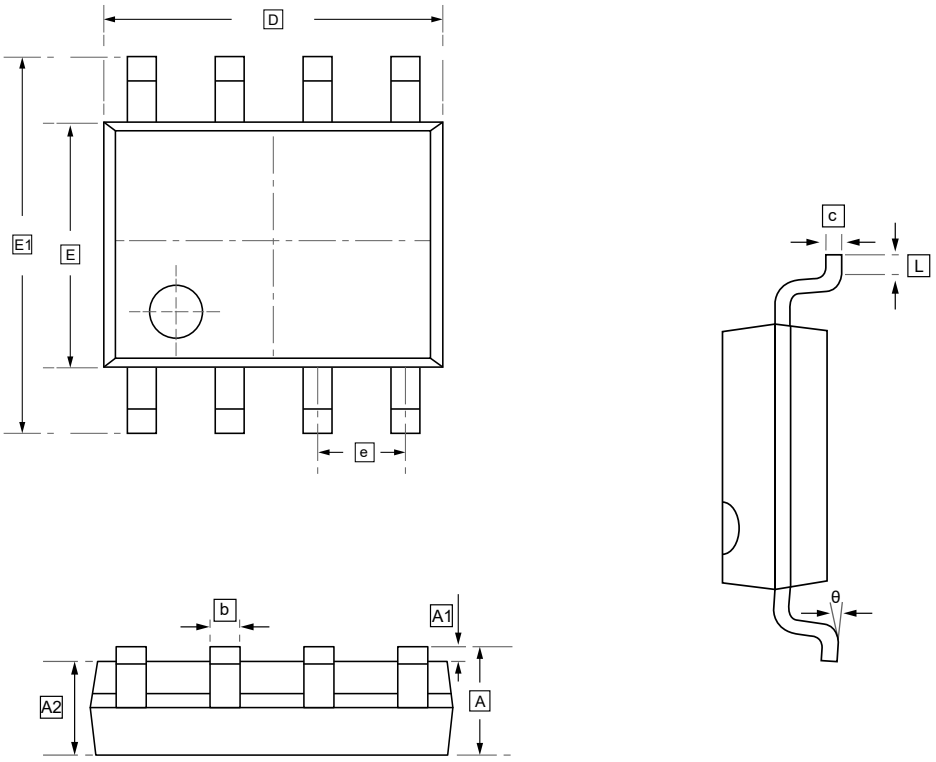


Figure 12: Peak Current Capability

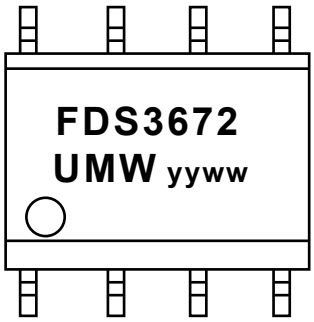
8.SOP-8 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	c	D	E	E1	e	L	θ
Min	1.350	0.000	1.350	0.330	0.170	4.700	3.800	5.800	1.270	0.400	0°
Max	1.750	0.100	1.550	0.510	0.250	5.100	4.000	6.200	BSC	1.270	8°

9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW FDS3672	SOP-8	3000	Tape and reel

10.Disclaimer

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