UMW FDB8832

30V N-Channel MOSFET

1.Features

- $V_{DS\ (V)}$=30V
- I_D=80A(V_{GS}=10V)
- $R_{DS(ON)}$<1.9mΩ(V_{GS}=10V)
- $R_{DS(ON)}$<2.2mΩ(V_{GS}=4.5V)
- Low Miller Charge
- Low Qrr Body Diode
- UIS Capability (Single Pulse and Repetitive Pulse)

2.Applications

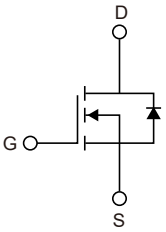
- Starter / Alternator Systems
- Electronic Power Steering Systems
- DC-DC Converters

3.Pinning information

Pin	Symbol	Description
1	G	GATE
2	D	DRAIN
3	S	SOURCE

TO-263





4.Absolute Maximum Ratings T_C= 25°C

Parameter	Symbol	Rating	Units
Drain to Source Voltage	V_{DSS}	30	V
Gate to Source Voltage	V_{GS}	±20	V
Drain Current Continuous (T_C<165°C, V_{GS}=10V)	I_D	80	A
Drain Current Continuous (T_C<163°C, V_{GS}=5V)		80	A
Drain Current Continuous (T_{amb}=25°C, V_{GS}=10V, with $R_{\theta JA}$=43°C/W)		34	A
Pulsed		Figure 4	A
Single Pulse Avalanche Energy (Note 1)	E_{AS}	1246	mJ
Power Dissipation	P_D	300	W
Derate above 25°C		2	W/°C
Storage Temperature	T_J, T_{STG}	-55 to 175	°C

5.Thermal Characteristics

Parameter	Symbol	Rating	Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.5	°C/W
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Ambient ,1in^2 copper pad area	$R_{\theta JA}$	43	°C/W

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

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Drain to Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V		30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V				1	μA
		V_{GS}=0V	T_J=150°C			250	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±20V				±100	nA
Gate to Source Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA		1	1.6	3	V
Drain to Source On Resistance	$R_{DS(ON)}$	I_D=80A, V_{GS}=10V			1.4	1.9	mΩ
		I_D=80A, V_{GS}=5V			1.5	2.1	mΩ
		I_D=80A, V_{GS}=4.5V			1.6	2.2	mΩ
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V, f=1MHz			11400		pF
Output Capacitance	C_{oss}				2140		pF
Reverse Transfer Capacitance	C_{rss}				1260		pF
Gate Resistance	R_g	V_{GS}=0.5V, f=1MHz			1.2		Ω
Total Gate Charge at 10V	$Q_{g(TOT)}$	V_{GS}=0V to 10V	V_{DD}=15V		204	265	nC
Total Gate Charge at 5V	$Q_{g(5)}$	V_{GS}=0V to 5V	I_D=80A		100	130	nC
Threshold Gate Charge	$Q_{g(TH)}$	V_{GS}=0V to 1V	I_g=1mA		10.9	14.2	nC
Gate to Source Gate Charge	Q_{gs}				33		nC
Gate Charge Threshold to Plateau	Q_{gs2}				22		nC
Gate to Drain “Miller” Charge	Q_{gd}				43		nC
Turn-On Time	$t_{(on)}$	V_{DD}=15V, I_D=80A V_{GS}=5V, R_{GS}=1.5Ω				155	ns
Turn-On Delay Time	$t_{D(on)}$				24		ns
Rise Time	t_r				73		ns
Turn-Off DelayTime	$t_{D(off)}$				54		ns
Fall Time	t_f				38		ns
Turn-Off Time	t_{off}					149	ns

Source to Drain Diode Forward Voltage	V_{SD}	I_{SD}=75A		0.8	1.25	V
		I_{SD}=40A		0.8	1	V
Reverse Recovery Time	t_{rr}	I_F=75A, di/dt=100A/μs		59	77	ns
Reverse Recovery Charge	Q_{rr}	I_F=75A, di/dt=100A/μs		67	87	nC

Notes:

1: Starting T_J=25°C, L=0.61mH, I_{AS}=64A, V_{DD}=30V, V_{GS}=10V.

2: Pulse width=100s.

7.1Typical characteristic

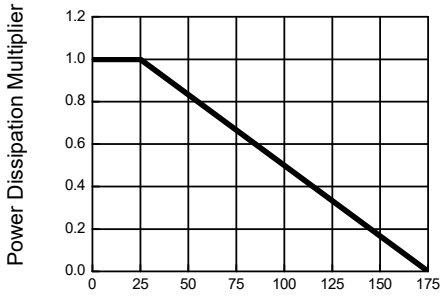


Figure 1: Normalized Power Dissipation vs Case Temperature

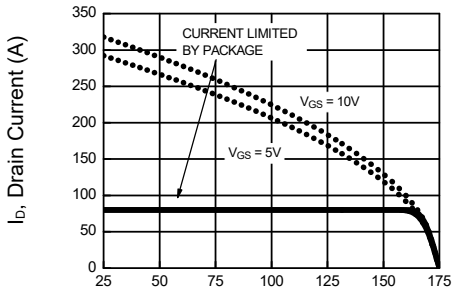


Figure 2: Maximum Continuous Drain Current vs Case Temperature

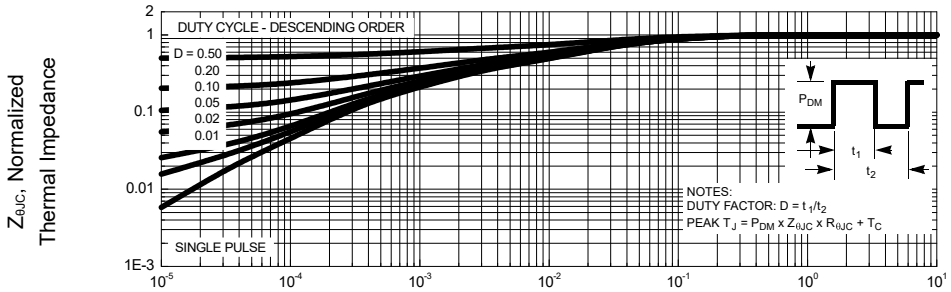


Figure 3: Normalized Maximum Transient Thermal Impedance

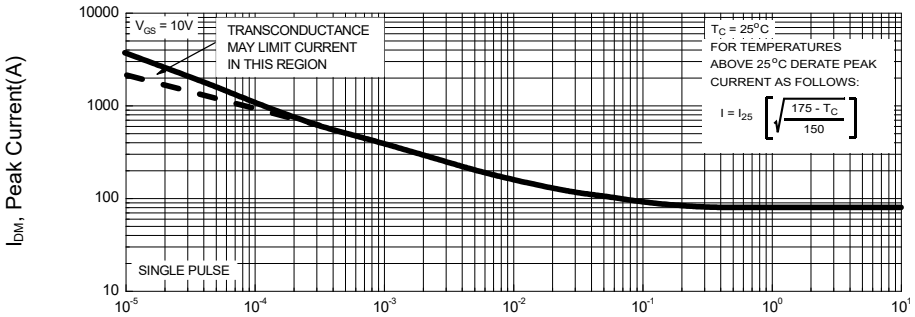
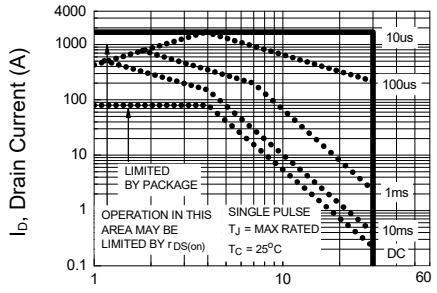


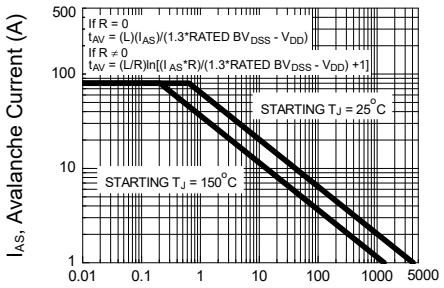
Figure 4: Peak Current Capability

7.2Typical characteristic



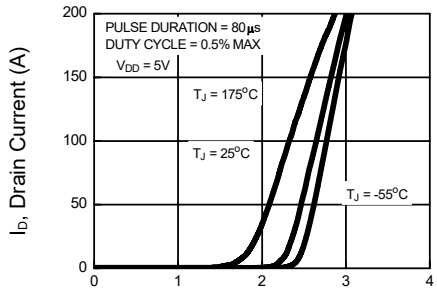
V_{DS}, Drain To Source Voltage (V)

Figure 5: Forward Bias Safe Operating Area



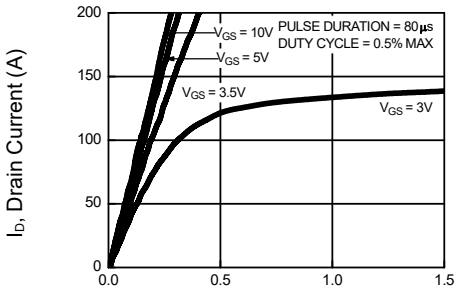
t_{AV}, Time In Avalanche (ms)

Figure 6: Unclamped Inductive Switching Capability



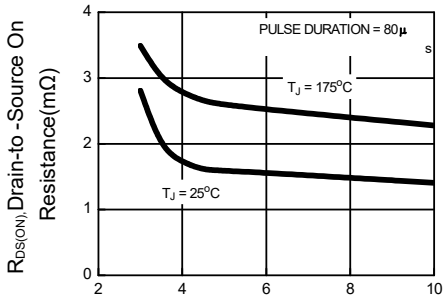
V_{GS}, Gate To Source Voltage (V)

Figure 7: Transfer Characteristics



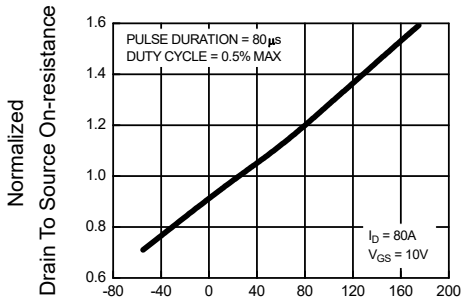
V_{DS}, Drain To Source Voltage (V)

Figure 8: Saturation Characteristics



$V_{GS,}$ Gate To Source Voltage (V)

Figure 9: Drain to Source On Resistance vs Gate Voltage and Drain Current



T_J, Junction Temperature(°C)

Figure 10: Normalized Drain to Source On Resistance vs Junction Temperature

7.3Typical characteristic

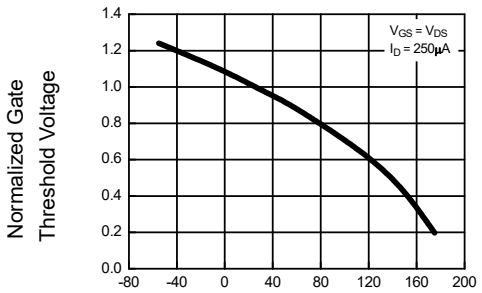


Figure 11: Normalized Gate Threshold Voltage vs Junction Temperature

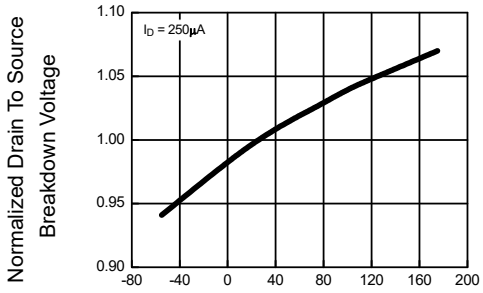


Figure 12: Normalized Drain to Source Breakdown Voltage vs Junction Temperature

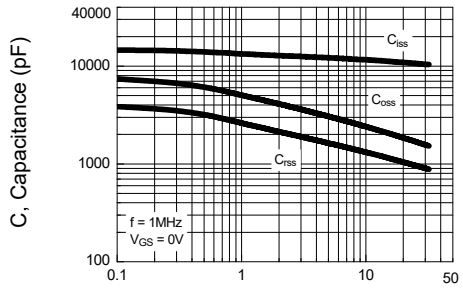


Figure 13: Capacitance vs Drain to Source Voltage

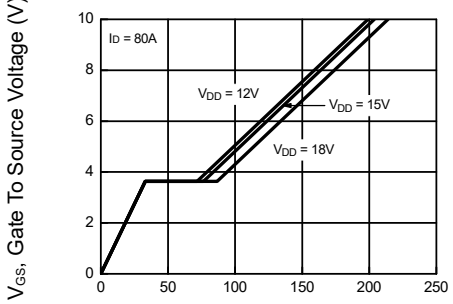
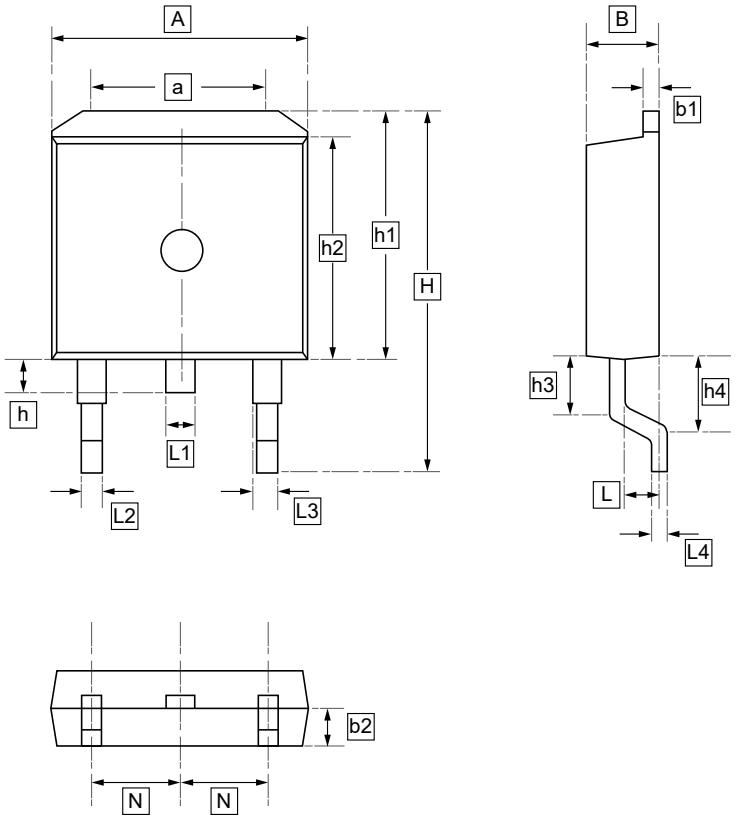


Figure 14: Gate Charge Waveforms for Constant Gate Current

8.TO-263 Package Outline Dimensions

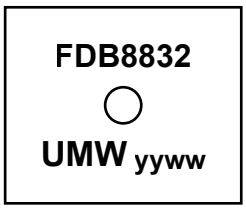


DIMENSIONS (mm are the original dimensions)

Symbol	A	a	B	b1	b2	H	h	h1	h2	h3	h4	L	L1	L2	L3
Min	9.6	7.2	4.3	1.25	2.2	15.2	1.34	10.3	9.1	1.34	2.5	2.2	1.2	0.7	1.2
Max	10.0	7.6	4.7	1.35	2.6	15.8	1.74	10.7	9.3	1.74	2.9	2.6	1.4	0.9	1.4

Symbol	L4	N
Min	0.4	2.4
Max	0.6	2.5

9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW FDB8832	TO-263	800	Tape and reel

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