UMW FDD044AN03L

30V N-Channel MOSFET

1.Features

- $V_{DS(V)}$=30V
- I_D=35A(V_{GS}=10V)
- $R_{DS(ON)}$<3.9mΩ(V_{GS}=10V)
- $R_{DS(ON)}$<4.4mΩ(V_{GS}=4.5V)
- Low Miller Charge
- Low Q_{rr} Body Diode
- UIS Capability (Single Pulse and Repetitive Pulse)

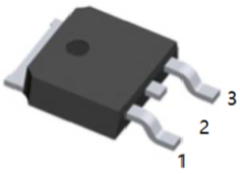
2.Applications

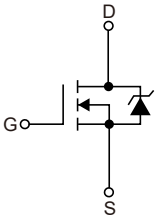
- 12V Automotive Load Control
- Starter / Alternator Systems
- Electronic Power Steering Systems
- ABS
- DC-DC Converters

3.Pinning information

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

TO-252(DPAK)
top view





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<168°C, V_{GS}=10V)	I_D	35	A
Continuous (T_C<167°C, V_{GS}=4.5V)		35	A
Continuous (T_{amb}=25°C, V_{GS}=10V, with $R_{\theta JA}$=52°C/W)		21	A
Pulsed		Figure 4	A
Single Pulse Avalanche Energy (Note 1)	E_{AS}	690	mJ
Power Dissipation	P_D	160	W
Derate above 25°C		1.07	°C/W
Operating and Storage Temperature	T_J, T_{STG}	-55 to 175	°C

5.Thermal Characteristics

Parameter	Symbol	Rating	Units
Thermal Resistance, Junction-to-Case TO-252	$R_{\theta JC}$	0.94	°C/W
Thermal Resistance, Junction-to-Ambient TO-252	$R_{\theta JA}$	100	°C/W
Thermal Resistance, Junction-to-Ambient TO-252,1in^2 copper pad area	$R_{\theta JA}$	52	°C/W

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

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Off Characteristics							
Drain to Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V		30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=25V				1	μA
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		1.2		2.5	V
Drain to Source On Resistance	$R_{DS(ON)}$	I_D=35A, V_{GS}=10V			3.2	3.9	mΩ
		I_D=35A, V_{GS}=4.5V			3.6	4.4	mΩ
Dynamic Characteristics							
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V, f=1MHz			5160		pF
Output Capacitance	C_{oss}				990		pF
Reverse Transfer Capacitance	C_{rss}				590		pF
Gate Resistance	R_g	V_{GS}=0.5V, f=1MHz			2.1		Ω
Total Gate Charge at 10V	$Q_{g(TOT)}$	V_{GS}=0V to 10V	V_{DD}=15V		91	118	nC
Total Gate Charge at 5V	$Q_{g(5)}$	V_{GS}=0V to 5V	I_D=35A		48	62	nC
Threshold Gate Charge	$Q_{g(TH)}$	V_{GS}=0V to 1V	I_g=1mA		5	6.5	nC
Gate to Source Gate Charge	Q_{gs}				14		nC
Gate Charge Threshold to Plateau	Q_{gs2}				9		nC
Gate to Drain “Miller” Charge	Q_{gd}				18		nC
Turn-On Time	$t_{(on)}$	V_{DD}=15V, I_D=35A V_{GS}=4.5V, R_{GS}=3.3Ω				261	ns
Turn-On Delay Time	$t_{D(on)}$				20		ns
Rise Time	t_r				154		ns
Turn-Off DelayTime	$t_{D(off)}$				42		ns
Fall Time	t_f				63		ns
Turn-Off Time	t_{off}					158	ns

Drain–Source Diode Characteristics						
Source to Drain Diode Forward Voltage	V_{SD}	I_{SD}=35A			1.25	V
		I_{SD}=15A			1	V
Reverse Recovery Time	t_{rr}	I_F=35A, di/dt=100A/μs			37	ns
Reverse Recovery Charge	Q_{rr}	I_F=35A, di/dt=100A/μs			21	nC

Notes:

1: Starting T_J=25°C, L=1.77mH, I_{AS}=28A.

7.1Typical characteristic

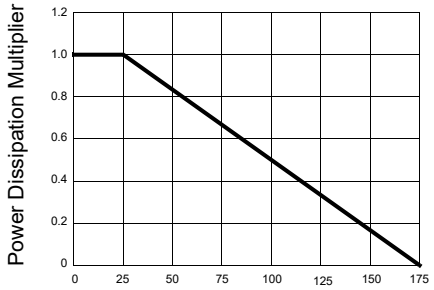


Figure 1: Normalized Power Dissipation vs Case Temperature

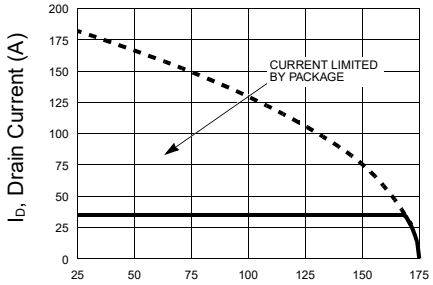


Figure 2: Maximum Continuous Drain Current vs Case Temperature

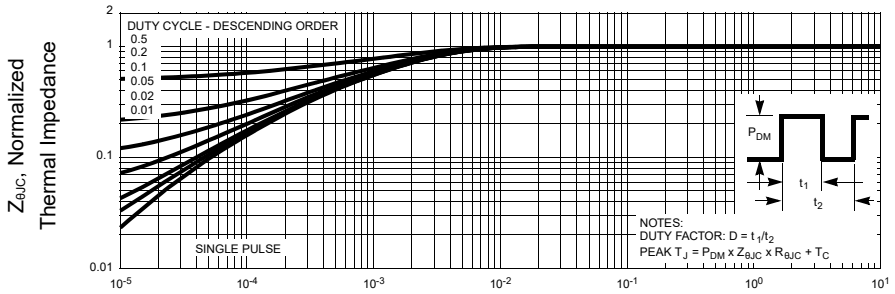


Figure 3: Normalized Maximum Transient Thermal Impedance

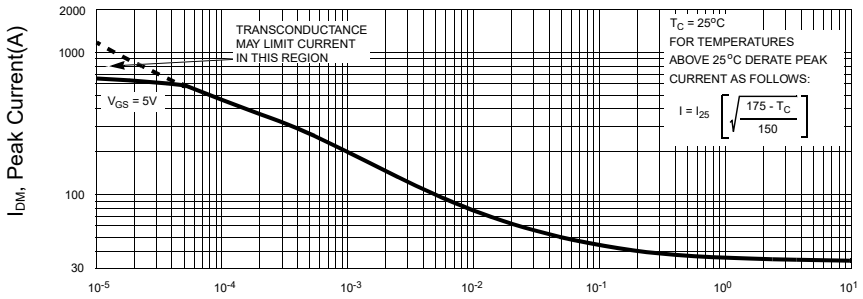


Figure 4: Peak Current Capability

7.2Typical characteristic

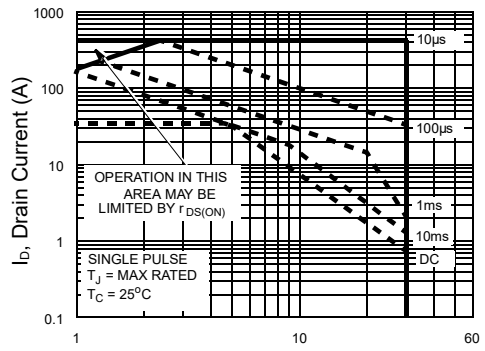


Figure 5: Forward Bias Safe Operating Area

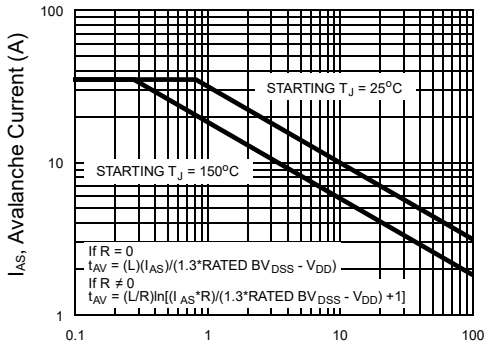


Figure 6: Unclamped Inductive Switching Capability

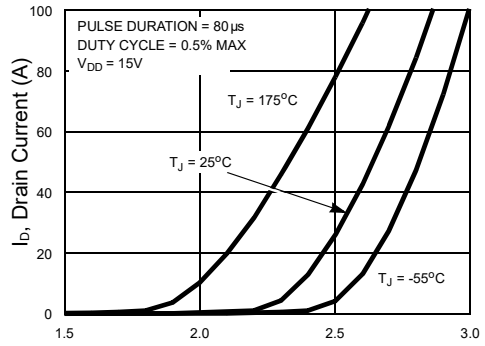


Figure 7: Transfer Characteristics

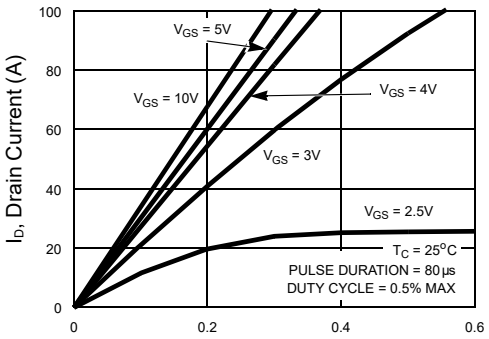


Figure 8: Saturation Characteristics

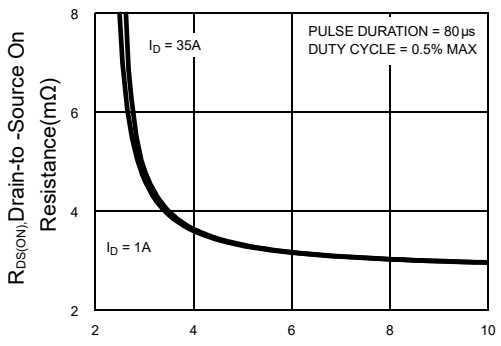


Figure 9: Drain to Source On Resistance vs Gate Voltage and Drain Current

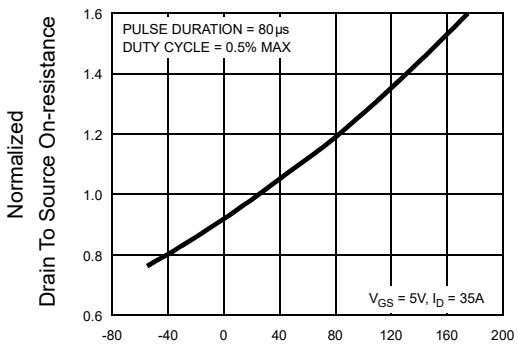


Figure 10: Normalized Drain to Source On Resistance vs Junction Temperature

7.3Typical characteristic

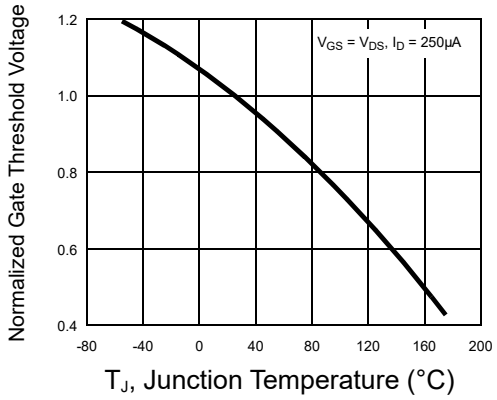


Figure 11: Normalized Gate Threshold Voltage vs Junction Temperature

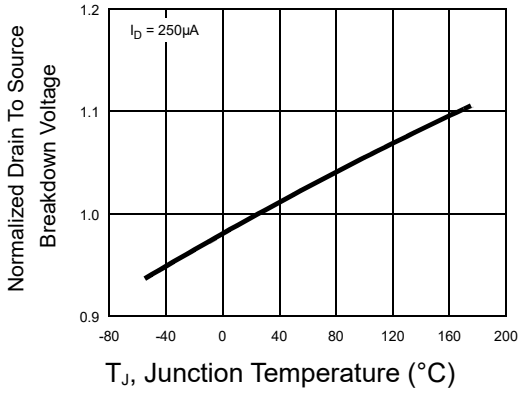


Figure 12: Normalized Drain to Source Breakdown Voltage vs Junction Temperature

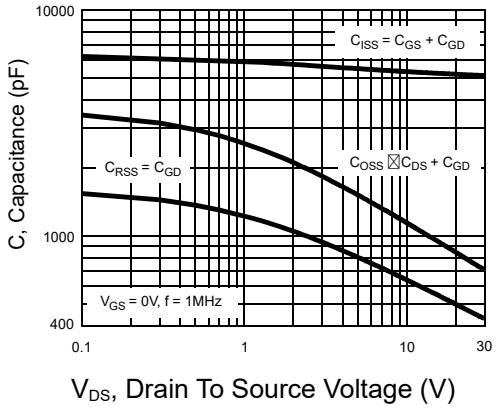


Figure 13: Capacitance vs Drain to Source Voltage

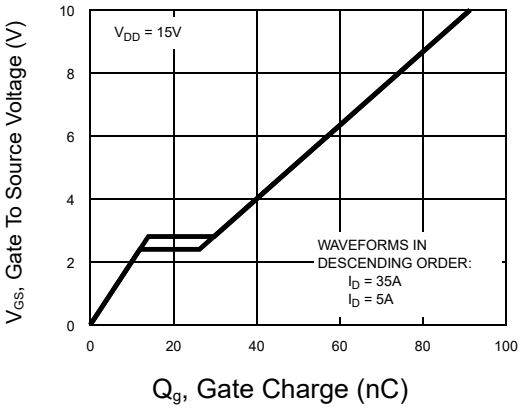
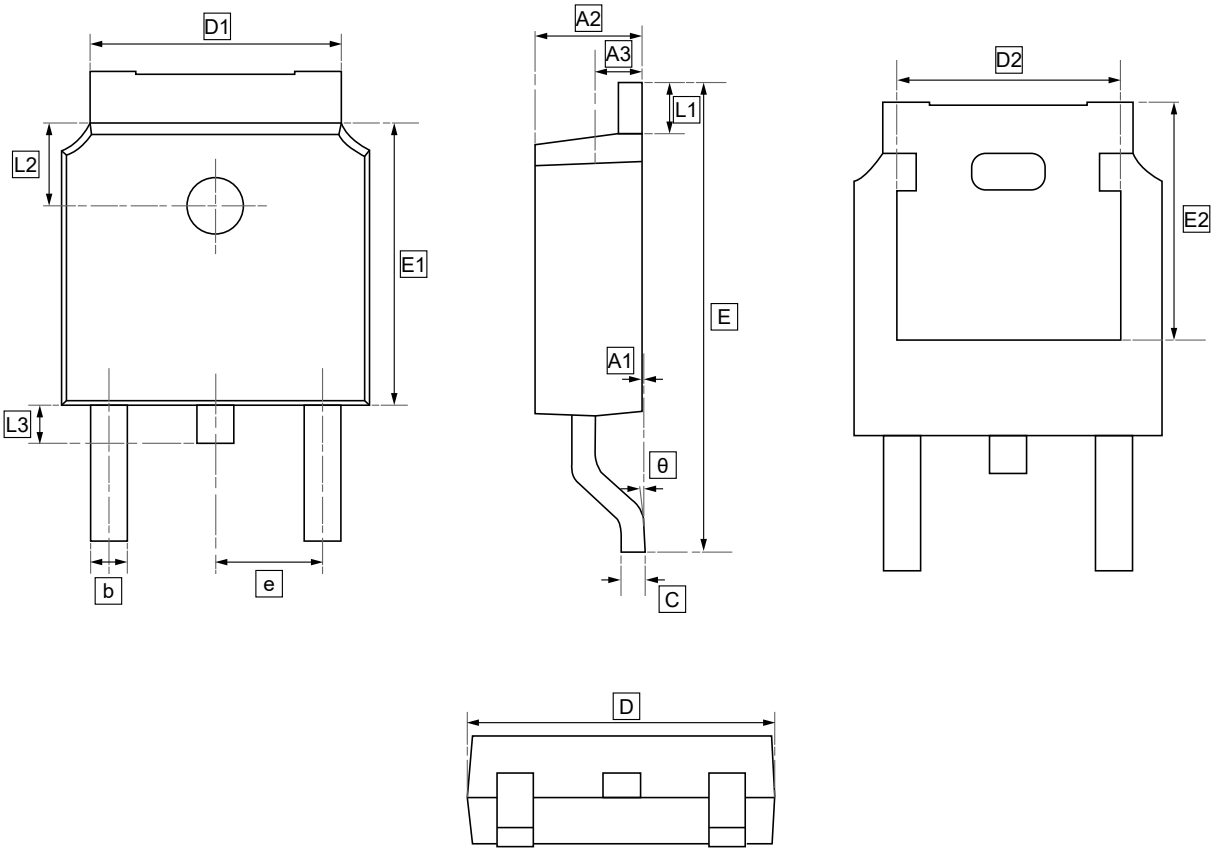


Figure 14: Gate Charge Waveforms for Constant Gate Current

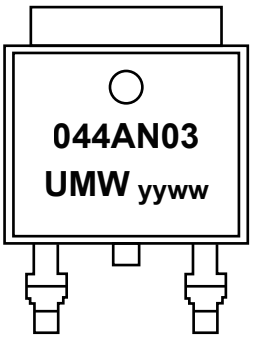
8.TO-252 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A1	A2	A3	b	c	D	D1	D2	E	E1	E2	e	L1	L2	L3	θ
Min	0.00	2.18	0.90	0.65	0.46	6.35	4.95	4.32	9.40	5.97	5.21	2.286	0.89	1.70	0.60	0.00
Max	0.13	2.39	1.10	0.85	0.61	6.73	5.46	4.90	10.41	6.22	5.38	BSC	1.27	1.90	1.00	8.00

9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW FDD044AN03L	TO-252	2500	Tape and reel

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