UMW 100N03A

30V N-Channel MOSFET

1.Description

These N-channel enhancement mode power mosfets used advanced trench technology design, provided excellent $R_{DS(ON)}$ and low gate charge. Which accords with the RoHS standard.

2.1 Features

- $V_{DS\ (V)}$=30V
- I_D=100A
- $R_{DS(ON)}$=3.8mΩ(V_{GS}=10V)
- $R_{DS(ON)}$=6.4mΩ(V_{GS}=4.5V)

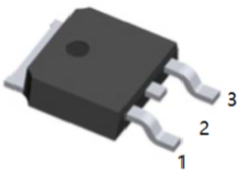
2.2 Features

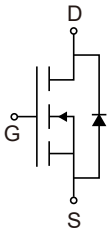
- Fast switching
- Low reverse transfer capacitances
- Low on resistance
- Low gate charge

3.Pinning Information

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

TO-252(DPAK)
top view





4.Absolute Maximum Ratings T_A= 25°C

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	
Drain Current-Continuous[Note3]	T_C=25°C	I_D	100	A
	T_C=100°C		63	
Drain Current-Pulsed[Note1]		I_{DM}	200	
Avalanche Energy[Note4]		E_{AS}	280	mJ
Avalanche Energy		I_{AS}	33	A
Maximum Power Dissipation	T_C=25°C	P_D	105	W
Storage Temperature Range		T_{STG}	-55 to 150	°C
Operating Junction Temperature Range		T_J	-55 to 150	°C

5.Thermal Resistance Rating

Parameter	Symbol	Min	Typ	Max	Units
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$		3.3		°C/W

6.Specifications (T_J= 25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_{DS}=250μA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate-Body Leakage	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
ON CHARACTERISTIC						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250μA	1	1.7	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_{DS}=30A		3.8	4.9	mΩ
		V_{GS}=4.5V, I_{DS}=20A		6.4	7.9	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V, f=1MHz		1963		pF
Output Capacitance	C_{oss}			248		pF
Reverse Transfer Capacitance	C_{rss}			221		pF
Gate Resisitance	R_g	V_{DD}=0V, V_{GS}=1V, f=1MHz		1.43		Ω
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{D(on)}$	V_{GS}=10V, V_{DS}=15V R_{GEN}=3Ω, I_D=20A		55		ns
Rise Time	t_r			36.4		ns
Turn-Off Delay Time	$t_{D(off)}$			37.5		ns
Fall Time	t_f			14		ns
Total Gate Charge at 10V	Q_g	V_{DS}=15V, I_{DS}=45A, V_{GS}=10V		41		nC
Gate to Source Gate Charge	Q_{gs}			6.4		nC
Gate to Drain“Miller”Charge	Q_{gd}			11		nC

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_{DS}=20A			1.2	V
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=20A		21.7		nS
Reverse Recovery Charge	Q_{rr}	di/dt=100A/μs		7.2		nC

Notes:

1: Repetitive rating; pulse width limited by maximum junction temperature .

2: Surface mounted on FR4 Board, t≤10sec.

3: Pulse width ≤ 300μs, duty cycle ≤ 2%.

4: E_{AS} condition: L=0.5mH,V_{DD}=15V,V_G=10V,V_{GATE}=30V,Start T_J=25°C.

7.1Typical Characterisitics

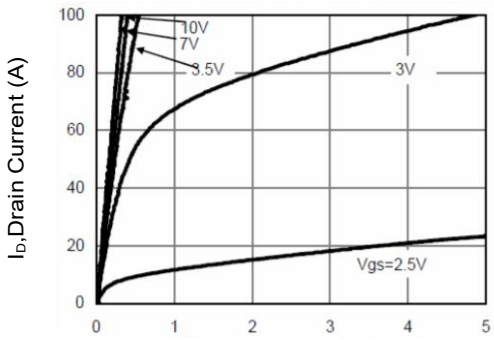


Figure 1: Output Characteristics

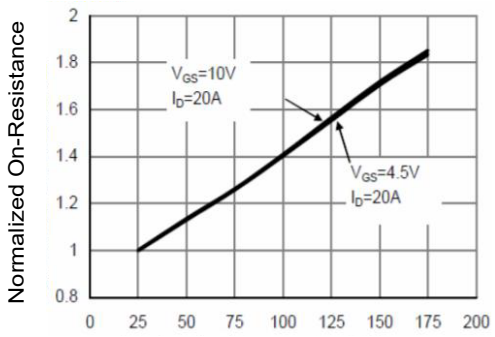


Figure 2: Rdson-Junction Temperature

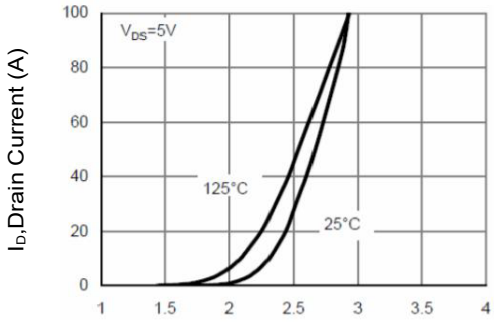


Figure 3: Transfer Characteristics

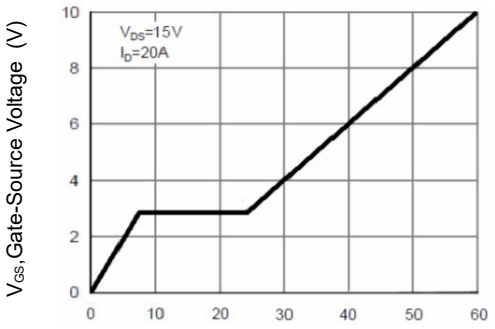


Figure 4: Gate Charge

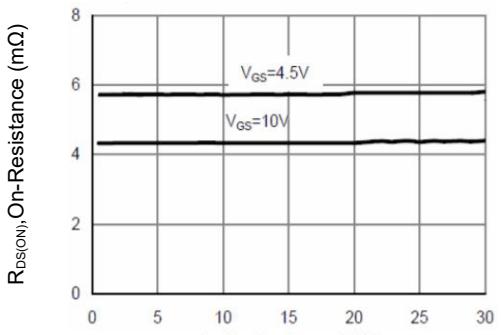


Figure 5: Rdson- Drain Current

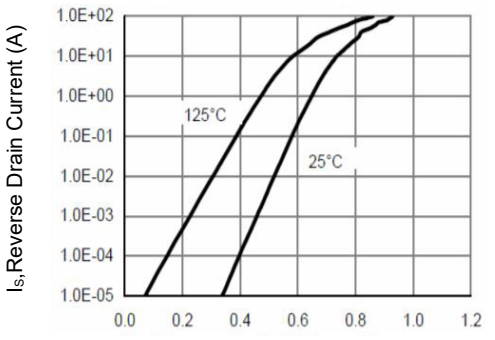
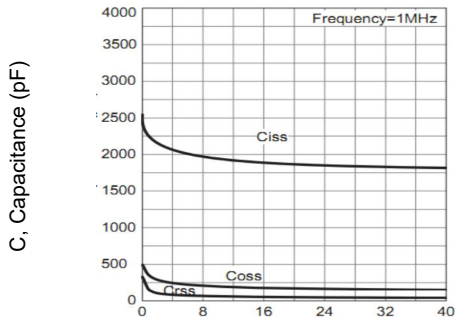


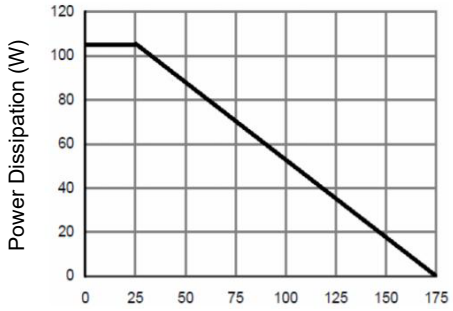
Figure 6: Source- Drain Diode Forward

7.2Typical Characterisitics



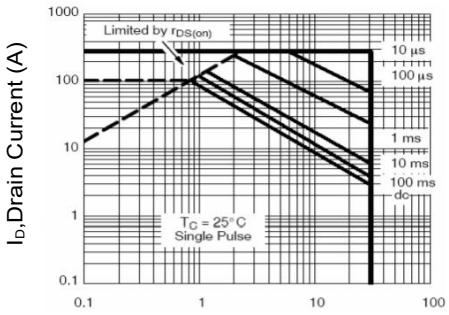
V_{DS}, Drain to Source Voltage (V)

Figure 7: Capacitance vs V_{DS}



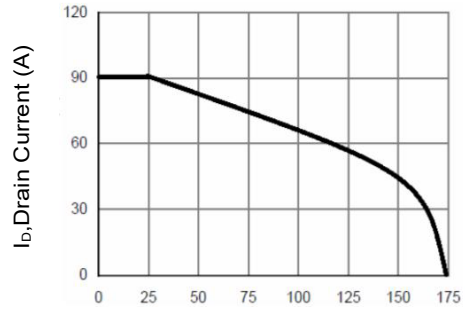
T_J,Junction Temperature(°C)

Figure 8: Power De-rating



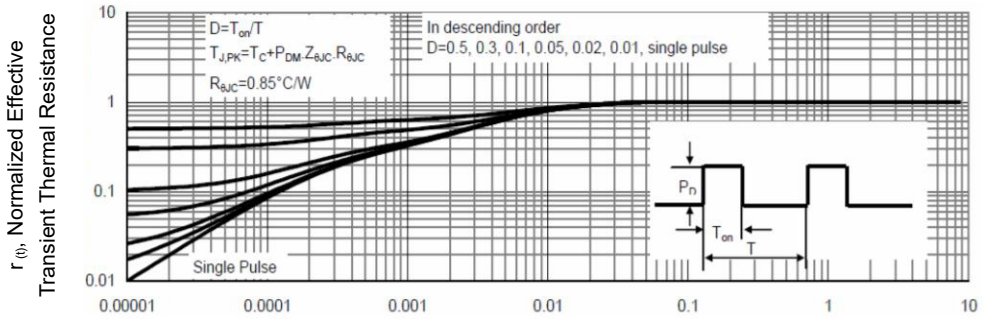
V_{DS}, Drain-Source Voltage (V)

Figure 9: Safe Operation Area



T_J,Junction Temperature(°C)

Figure 10: ID Current Derating



Square Wave Pulse Duration (sec)

Figure 11: Normalized Maximum Transient Thermal impedance

7.3Typical Characterisitics

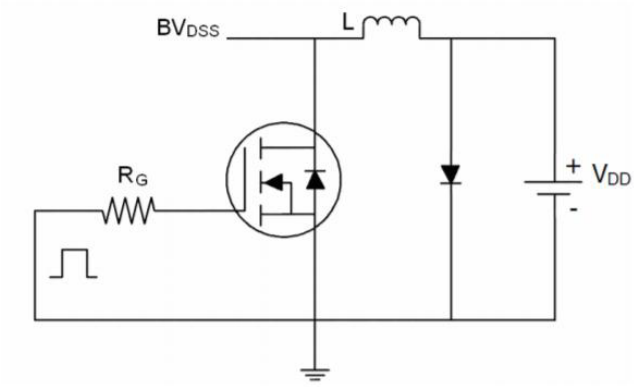


Figure 12: E_{AS} Test Circuit

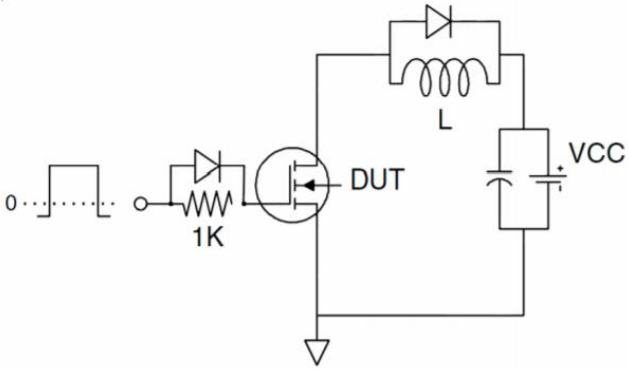


Figure 13: Gate Charge Test Circuit

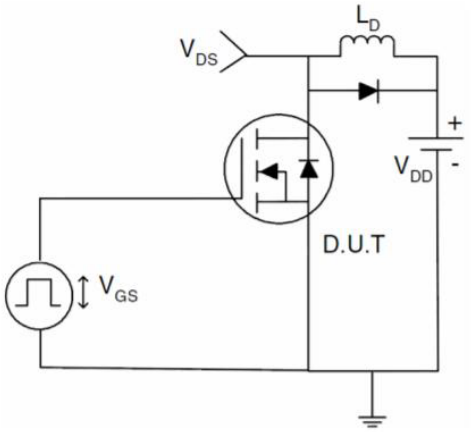
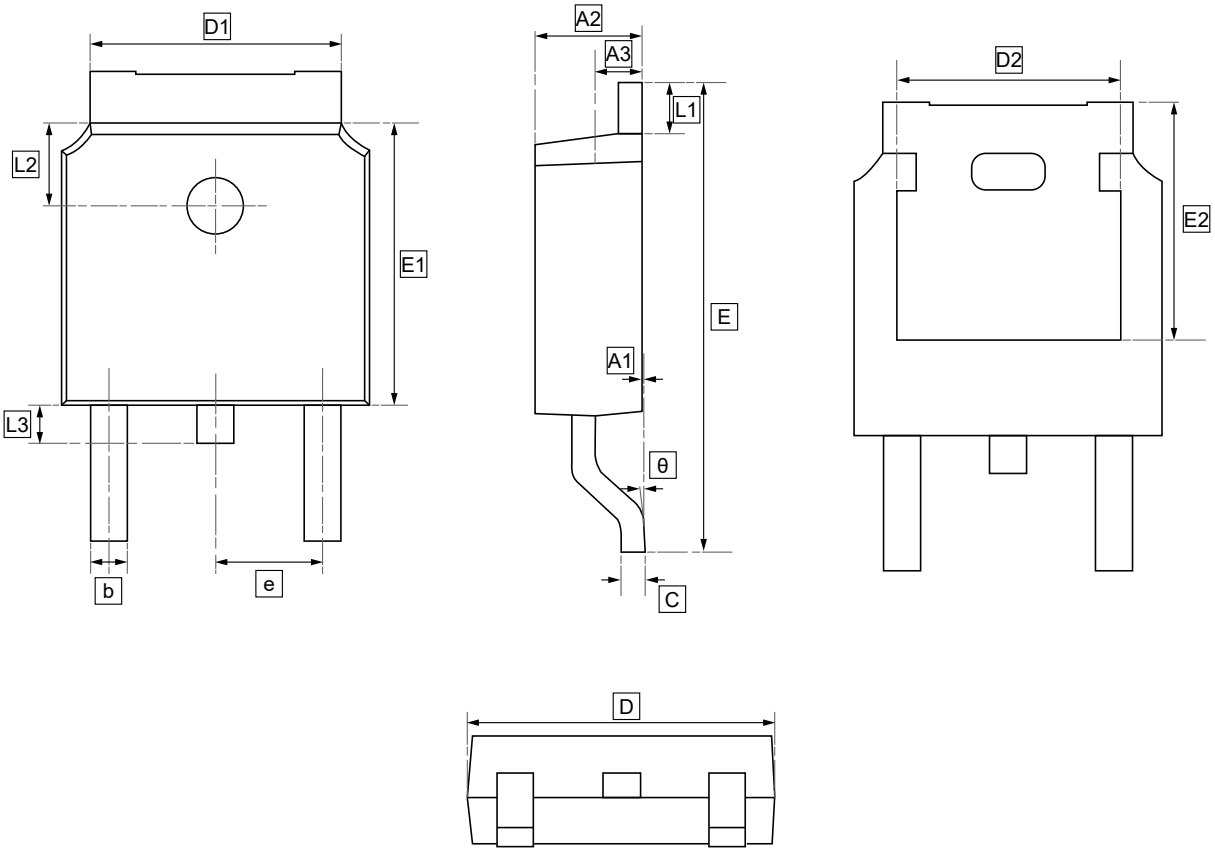


Figure 14: Switch Time Test Circuit

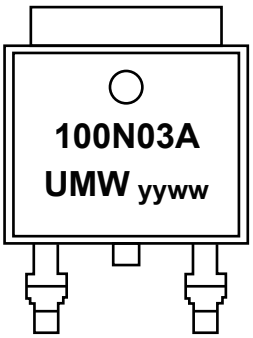
8.TO-252 Package Outline Dimensions



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 100N03A	TO-252	2500	Tape and reel

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