UMW 30N03A

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.

2.1Features

- $V_{DS\,(V)}$=30V
- I_D=90A(V_{GS}=10V)
- $R_{DS(ON)}$=3.9mΩ(V_{GS}=10V)
- $R_{DS(ON)}$=6.5mΩ(V_{GS}=4.5V)

2.2Features

- 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
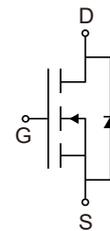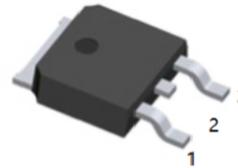
4.Absolute Maximum Ratings T_A= 25°C

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	90	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

UMW 30N03A

5.Thermal resistance rating

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

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UMW 30N03A

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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		3.9	5	mΩ
		V_{GS}=4.5V, I_{DS}=20A		6.5	8	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	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.

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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

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7.2Typical Characterisitics

Figure 7: Capacitance vs V_{DS}

Figure 8: Power De-rating

Figure 9: Safe Operation Area

Figure 10: ID Current Derating

Figure 11: Normalized Maximum Transient Thermal impedance

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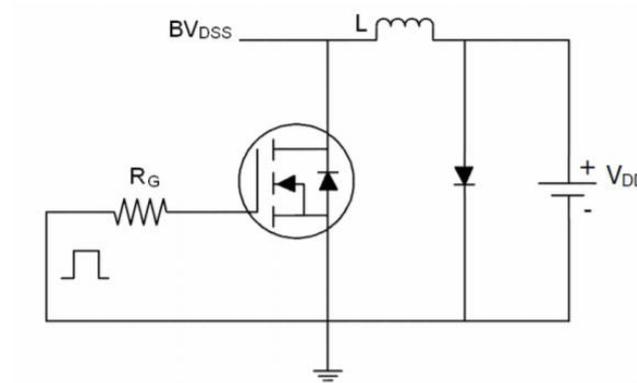Nov.2024

7.3Typical Characterisitics
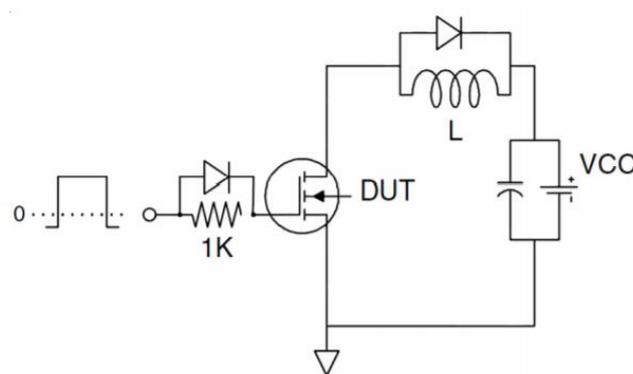

Figure 12: E_{AS} Test Circuit

Figure 13: Gate Charge Test Circuit
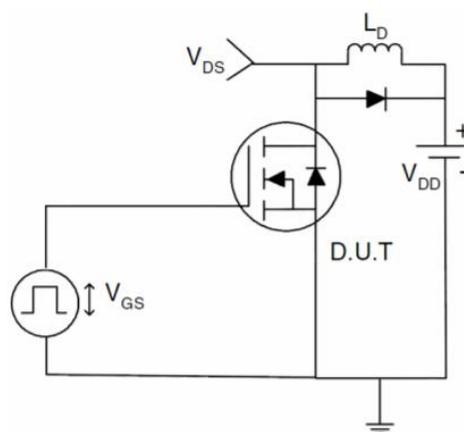
Figure 14: Switch Time Test Circuit

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8.TO-252 Package Outline Dimensions
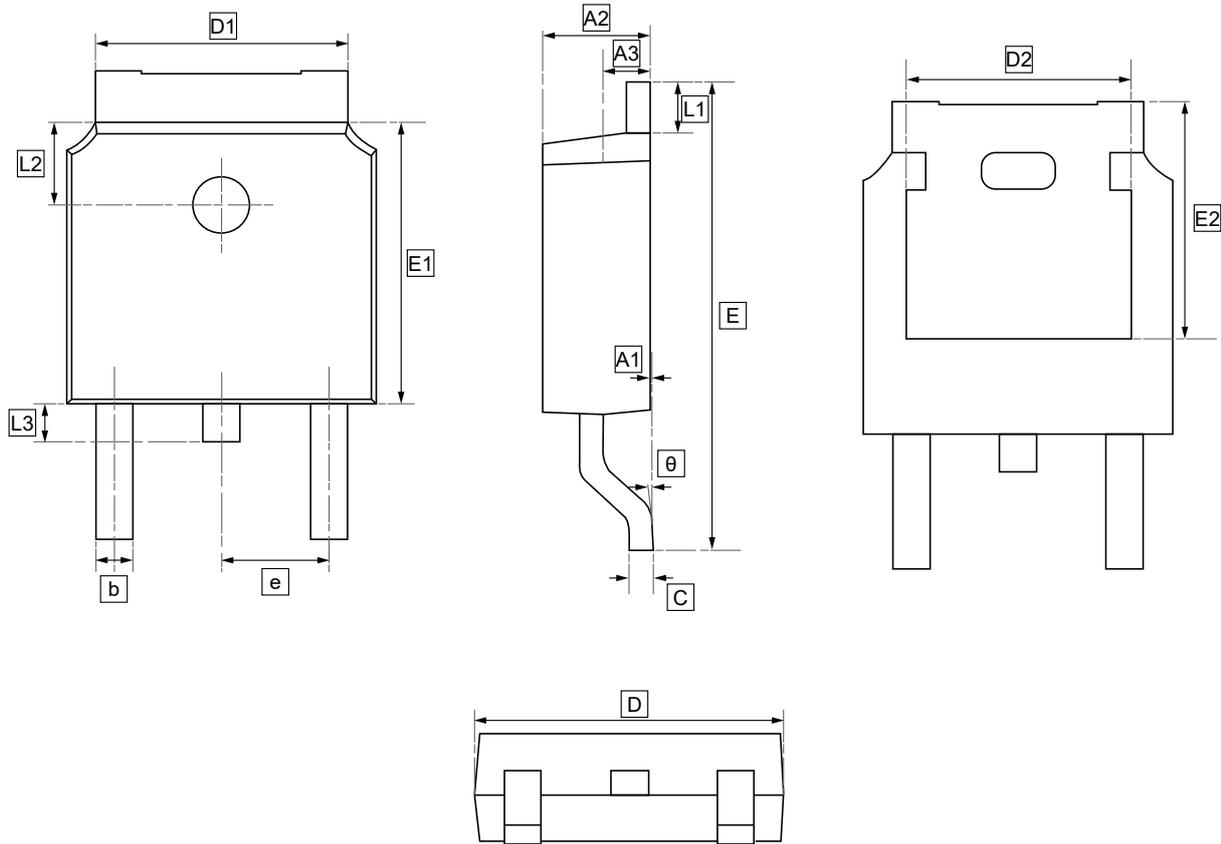
DIMENSIONS (mm are the original dimensions)

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

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9.Ordering information

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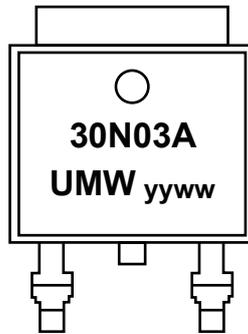
yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW 30N03A	TO-252	2500	Tape and reel

10.Disclaimer

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