

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.

2.2Features

- Fast switching
- Low reverse transfer capacitances

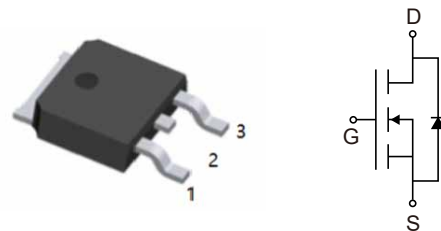
2.1Features

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

3.Pinning information

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

TO-252(DPAK)
top view



4.Absolute Maximum Ratings $T_A=25^{\circ}C$

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	
Drain Current-Continuous ^{Note3}	$T_C=25^{\circ}C$	I_D	90	A
	$T_C=100^{\circ}C$		63	
Drain Current-Pulsed ^{Note1}		I_{DM}	200	
Avalanche Energy ^{Note4}		E_{AS}	280	mJ
Avalanche Energy		I_{AS}	33	A
Maximum Power Dissipation	$T_C=25^{\circ}C$	P_D	105	W
Storage Temperature Range		T_{STG}	-55 to 150	$^{\circ}C$
Junction Temperature Range		T_J	-55 to 150	$^{\circ}C$



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		3.9	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}	$T_J=25^{\circ}C, I_F=20A$		21.7		nS
Reverse Recovery Charge	Q_{rr}			7.2		nC

Notes:

- 1: Repetitive rating; pulse width limited by maximum junction temperature .
- 2: Surface mounted on FR4 Board, $t_s \leq 10sec$.
- 3: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- 4: E_{AS} condition: $L=0.5mH, V_{DD}=15V, V_G=10V, V_{GATE}=30V$, Start $T_J=25^{\circ}C$.



7.1 Typical Characteristics

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

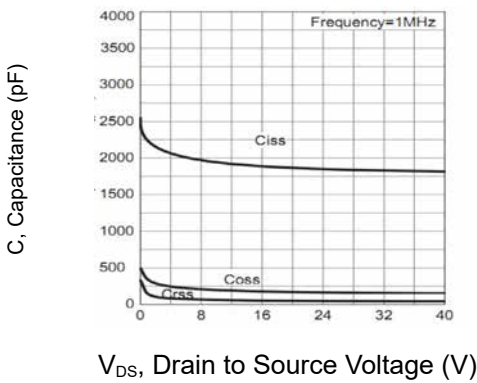


Figure 7: Capacitance vs V_DS

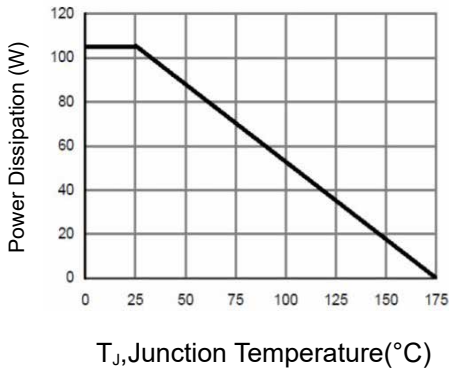


Figure 8: Power De-rating

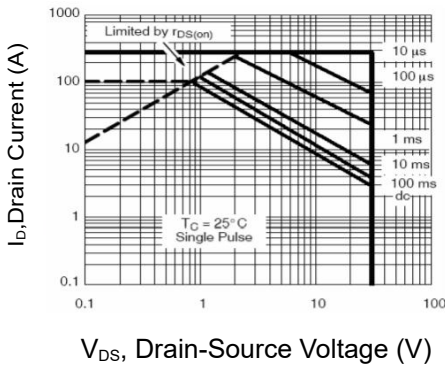


Figure 9: Safe Operation Area

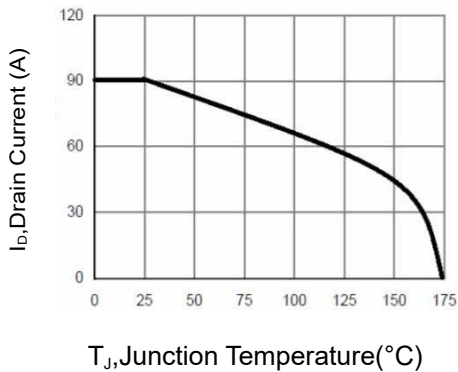


Figure 10: ID Current Derating

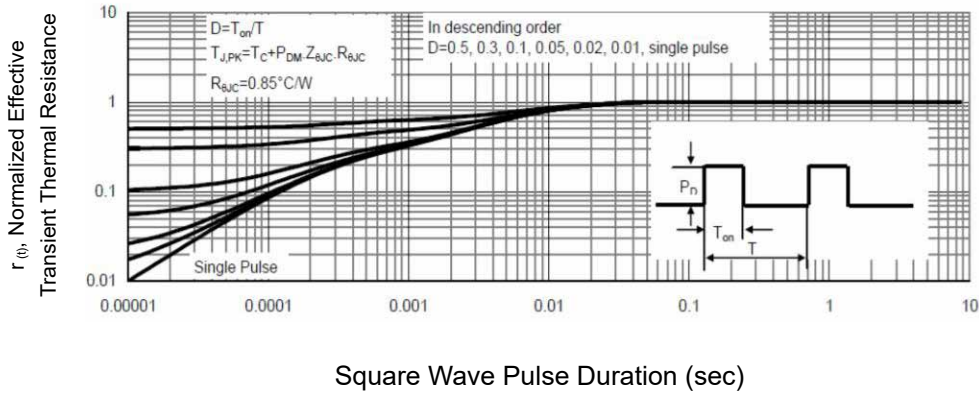


Figure 11: Normalized Maximum Transient Thermal impedance



7.3 Typical Characteristics

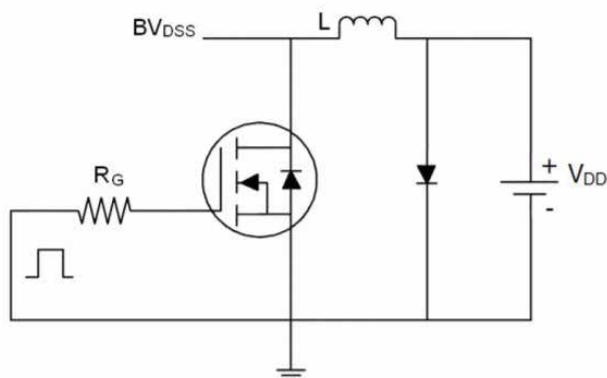
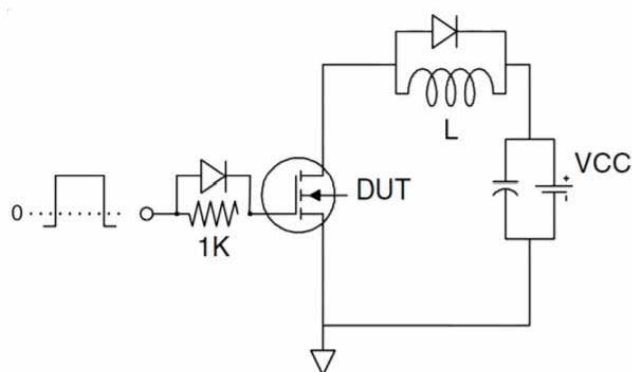
Figure 12: E_{AS} Test Circuit

Figure 13: Gate Charge Test Circuit

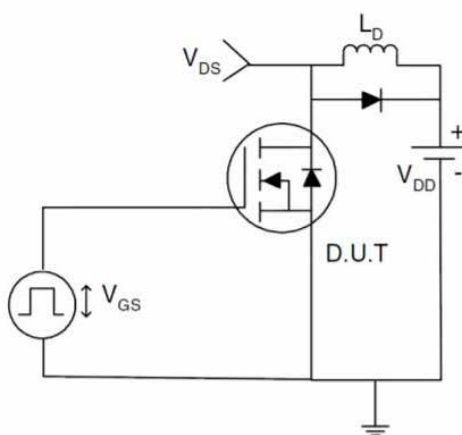
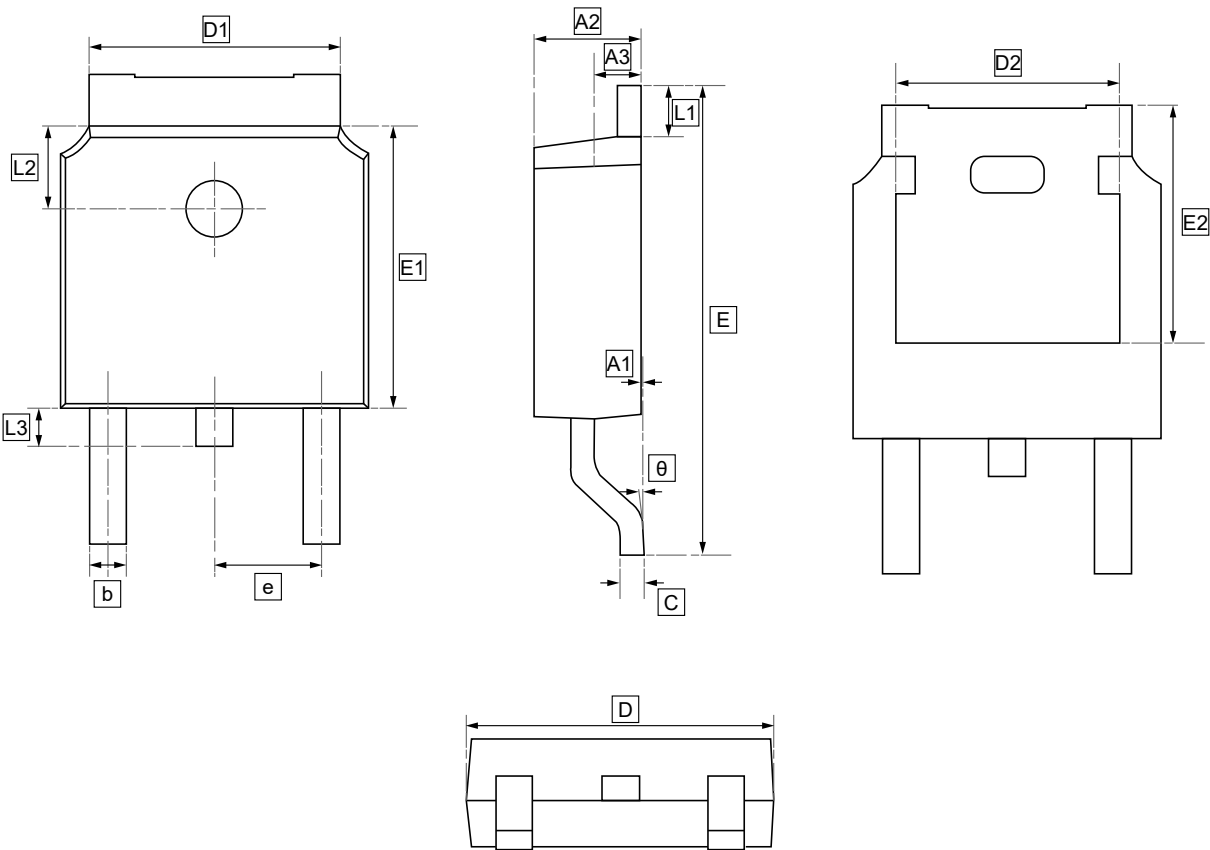


Figure 14: Switch Time Test Circuit



8.TO-252 Package Outline Dimensions

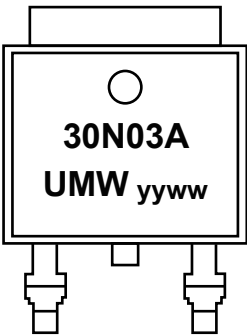


DIMENSIONS (mm are the original dimensions)

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 BSC	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		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 30N03A	TO-252	2500	Tape and reel



10.Disclaimer

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