UMW 12N10

100V N-Channel MOSFET

1.Features

- $V_{DS\ (V)}$=100V
- I_D=15A(V_{GS}=10V)
- $R_{DS(ON)}$=0.114Ω(V_{GS}=10V)

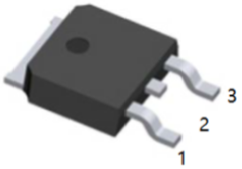
2.Applications

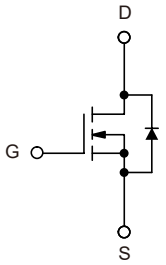
- Primary Side Switch

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}	100	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current (T_J=175°C)[b]	T_C=25°C	I_D	15	A
	T_C=125°C		13	
Pulsed Drain Current		I_{DM}	40	
Continuous Source Current (Diode Conduction)		I_S	3	
Avalanche Current		I_{AS}	3	
Single Pulse Avalanche Energy	L=0.1mH	E_{AS}	18	mJ
Maximum Power Dissipation	T_C=25°C	P_D	96 [b]	W
	T_A=25°C		3 [a]	W
Operating Junction Temperature Range		T_J, T_{STG}	-55 to 175	°C

5.Thermal Resistance Rating

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient [a]	t ≤ 10s	$R_{\theta JA}$	15	18	°C/W
	Steady-State		40	50	°C/W
Junction-to-Case (Drain)		$R_{\theta JC}$	0.85	1.1	°C/W

Notes:

a. Surface mounted on 1" x 1" FR4 board.

b. See SOA curve for voltage derating.

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-source breakdown voltage	V_{DS}	V_{GS}=0V, I_D=250μA	100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1		2.5	V
Gate-Body Leakage	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V			1	μA
		V_{DS}=100V, V_{GS}=0V, T_J=125°C			50	μA
		V_{DS}=100V, V_{GS}=0V, T_J=175°C			250	μA
On-State Drain Current	$I_{D(ON)}$	V_{DS}=5V, V_{GS}=10V	40			A
Drain-Source On-State Resistance [b]	$R_{DS(ON)}$	V_{GS}=10V, I_D=3A		114		mΩ
		V_{GS}=10V, I_D=3A, T_J=125°C		120		mΩ
		V_{GS}=10V, I_D=3A, T_J=175°C		140		mΩ
		V_{GS}=4.5V, I_D=3A		120		mΩ
Forward Transconductance [b]	g_{FS}	V_{DS}=15V, I_D=3A		35		S
Dynamic [a]						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, F=1MHz		950		pF
Output Capacitance	C_{oss}			120		pF
Reverse Transfer Capacitance	C_{rss}			60		pF
Total Gate Charge [c]	Q_g	V_{DS}=50V, V_{GS}=10V, I_D=3A		24	41	nC
Gate-Source Charge [c]	Q_{gs}			8		nC
Gate-Drain Charge [c]	Q_{gd}			12		nC
Gate Resistance	R_g		0.5		2.9	Ω
Turn-On Delay Time [c]	$t_{D(on)}$	V_{DD}=50V, R_L=5.2Ω, I_D≈-3A, V_{GEN}=10V, R_G=2.5Ω		15	25	ns
Rise Time [c]	t_r			50	75	ns
Turn-Off Delay Time [c]	$t_{D(off)}$			30	45	ns
Fall time [c]	t_f			60	90	ns

Source-Drain Diode Ratings and Characteristics (T_C=25°C)						
Pulsed Current	I_{SM}				5	A
Diode Forward Voltage [b]	V_{SD}	I_F=3A, V_{GS}=0V		0.9	1.5	V
Source-Drain Reverse Recovery Time	t_{rr}	I_F=3A, dI/dt=100A/μs		180	250	ns

Notes:

a. Guaranteed by design, not subject to production testing.

b. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.

c. Independent of operating temperature.

7.1Typical Characterisitics

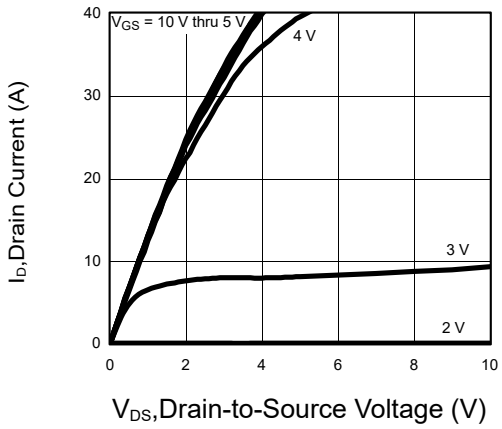


Figure 1: Output Characteristics

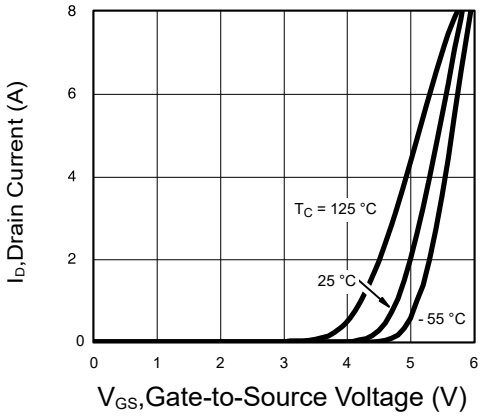


Figure 2: Transfer Characteristics

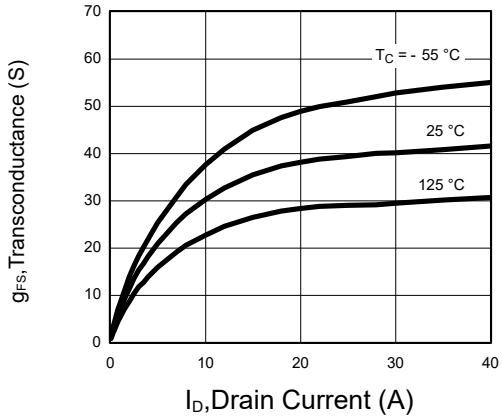


Figure 3: On-Resistance vs. Drain Current

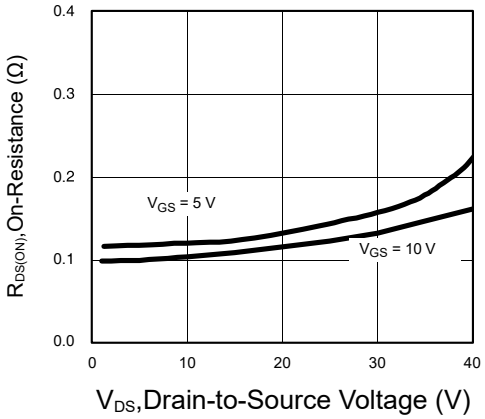


Figure 4: On-Resistance vs. Drain Current

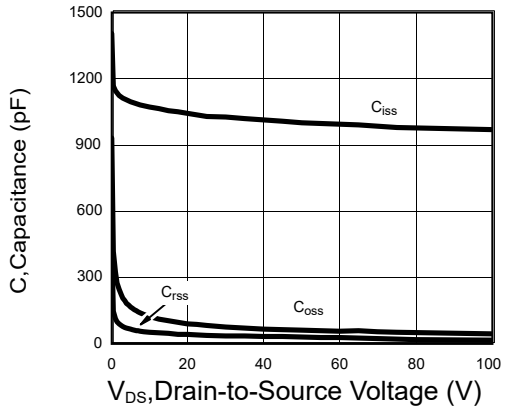


Figure 5: Capacitance

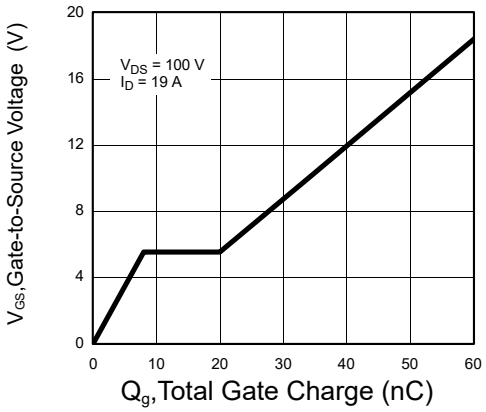


Figure 6: Gate Charge

7.2Typical Characterisitics

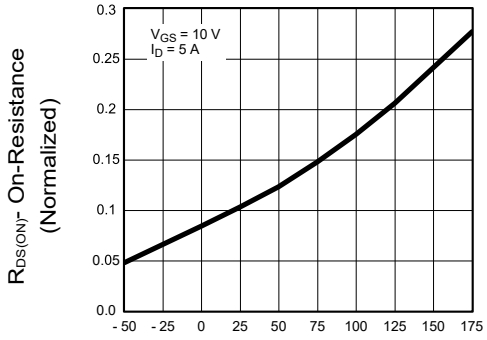


Figure 7: On-Resistance vs. Junction Temperature

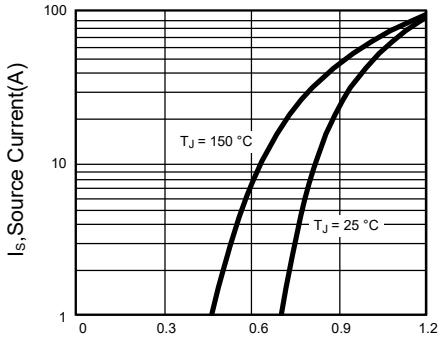


Figure 8: Source-Drain Diode Forward Voltage

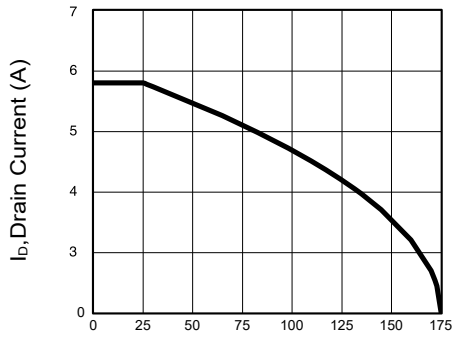


Figure 9: Maximum Avalanche Drain Current vs. Case Temperature

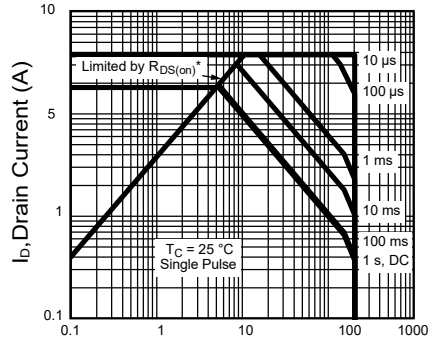


Figure 10: Safe Operating Area

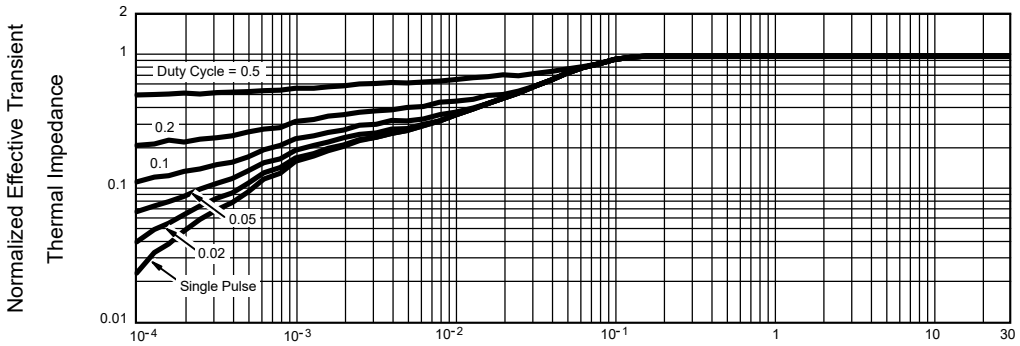
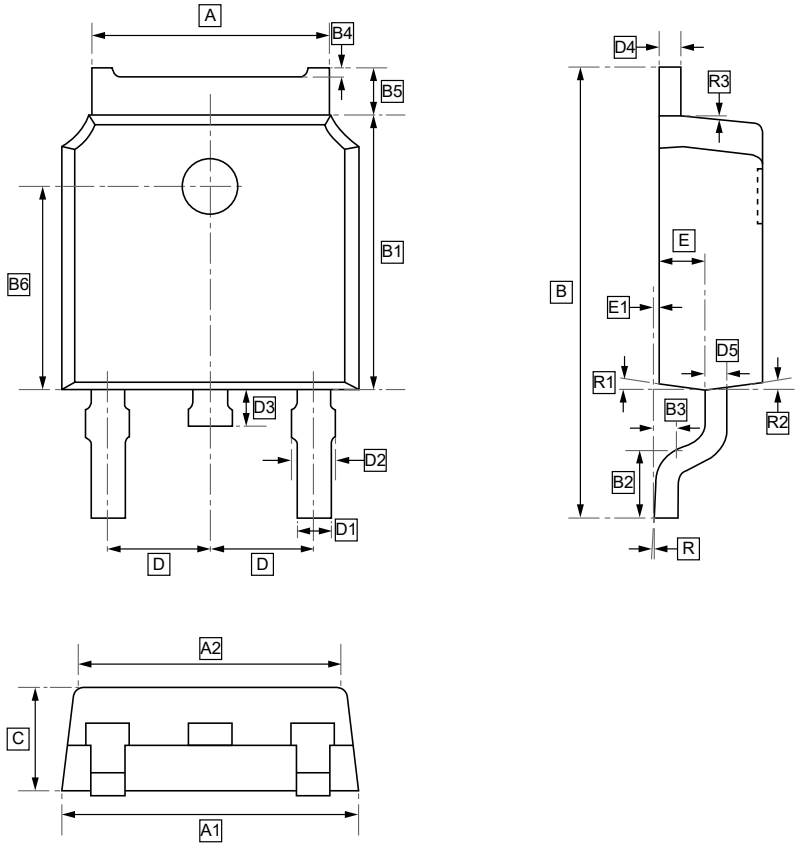


Figure 11: Normalized Thermal Transient Impedance, Junction-to-Case

8.TO-252 Package Outline Dimensions

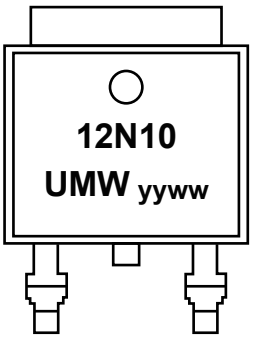


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	B	B1	B2	B3	B4	B5	B6	C	D
Min	5.1	6.4	5.6	9.5	5.9	1.35	0.4	0.1	0.85	4.35	2.15	2.286
Max	5.5	6.8	6.0	10.3	6.3	1.65	0.6	(typ.)	1.05	4.65	2.45	(typ.)

Symbol	D1	D2	D3	D4	D5	E	E1	R	R1	R2	R3
Min	0.66	0.81	0.65	0.42	0.42	0.86	0.05	0°	7°	7°	7°
Max	0.86	1.01	0.95	0.58	0.58	1.16	0.05	6°	(typ.)	(typ.)	(typ.)

9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW 12N10	TO-252	2500	Tape and reel

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