

1.Description

This N-Channel enhancement mode power MOSFET is produced using proprietary planar stripe and DMOS technology. This advanced MOSFET technology has been especially tailored to reduce on-state resistance, and to provide superior switching performance and high avalanche energy strength.

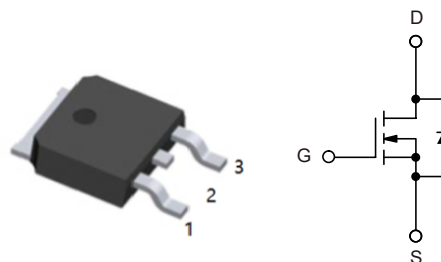
2.Features

- $V_{DS(V)}=100V$
- $I_D=15.6A$
- $R_{DS(ON)}<100m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}<110m\Omega(V_{GS}=5V)$
- Low Gate Charge (Typ. 14 nC)
- Low Crss (Typ. 35 pF)

3.Pinning information

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

TO-252(DPAK)
top view



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

Parameter	Symbol	Rating	Units
Drain - Source Voltage	V_{DSS}	100	V
Drain Current - Continuous $T_c=25^{\circ}C$	I_D	15.6	A
- Continuous $T_c=100^{\circ}C$		9.8	A
- Pulsed (Note 1)	I_{DM}	62.4	A
Gate-Source Voltage	V_{GSS}	± 20	V
Single Pulse Avalanche Energy (Note 2)	E_{AS}	220	mJ
Avalanche Current (Note 1)	I_{AR}	15.6	A
Repetitive Avalanche Energy (Note 1)	E_{AR}	5	mJ
Peak Diode Recovery dv/dt (Note 3)	dv/dt	6	V/ns



Power Dissipation ($T_A=25^{\circ}\text{C}$) *	P_D	2.5	W
Power Dissipation ($T_C=25^{\circ}\text{C}$)		50	W
- Derate above 25°C		0.4	W/ $^{\circ}\text{C}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^{\circ}\text{C}$
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	T_L	300	$^{\circ}\text{C}$

5. Thermal Characteristics

Parameter	Symbol	Rating	Units
Thermal Resistance, Junction to Case, Max	$R_{\theta JC}$	2.5	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient (Minimum Pad of 2-oz Copper), Max	$R_{\theta JA}$	110	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient (*1 in ² Pad of 2-oz Copper), Max	$R_{\theta JA}$	50	$^{\circ}\text{C}/\text{W}$



6. Electrical Characteristic ($T_c=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D=250\mu A$, $V_{GS}=0V$	100			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	$I_D=250\mu A$ Referenced to 25°C		0.09		V/°C
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V$, $V_{GS}=0V$			1	μA
		$V_{GS}=80V$, $T_C=125^\circ C$			10	μA
Gate-Body Leakage Current, Forward	I_{GSSF}	$V_{GS}=20V$, $V_{DS}=0V$			100	nA
Gate-Body Leakage Current, Reverse	I_{GSSR}	$V_{GS}=-20V$, $V_{DS}=0V$			-100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu A$	1		2	V
Static Drain-Source	$R_{DS(ON)}$	$V_{GS}=10V$, $I_D=7.8A$		74	100	mΩ
On-Resistance		$V_{GS}=5V$, $I_D=7.8A$		82	110	mΩ
Forward Transconductance	g_{FS}	$V_{DS}=30V$, $I_D=7.8A$		14		S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=25V$, $V_{GS}=0V$, $f=1MHz$		670	870	pF
Output Capacitance	C_{oss}			160	210	pF
Reverse Transfer Capacitance	C_{rss}			35	45	pF
Switching Characteristics						
Turn-On DelayTime	$t_{D(on)}$	$V_{DD}=50V$, $I_D=19A$ $R_G=25\Omega$ (Note 4)		14	38	ns
Turn-On Rise Time	t_r			410	830	ns
Turn-Off DelayTime	$t_{D(off)}$			20	50	ns
Turn-Off Fall Time	t_f			140	290	ns
Total Gate Charge	Q_g	$V_{DS}=80V$, $I_D=19A$ $V_{GS}=5V$ (Note 4)		14	18	nC
Gate to Source Charge	Q_{gs}			2.9		nC
Gate to Drain Charge	Q_{gd}			9.2		nC



Drain-Source Diode Characteristics						
Maximum Continuous Drain-Source Diode Forward Current	I_S				15.6	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				62.4	A
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=10A$			1.5	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_S=12.8A$		80		ns
Reverse Recovery Charge	Q_{rr}			0.195		μC

Notes:

1. Repetitive rating : pulse-width limited by maximum junction temperature.
2. $L=1.35mH$, $I_{AS}=15.6A$, $V_{DD}=25V$, $R_G=25\Omega$, starting $T_J=25^\circ C$.
3. $I_{SD} \leq 19A$, $di/dt \leq 300 A/\mu s$, $V_{DD} \leq BV_{DSS}$, starting $T_J=25^\circ C$.
4. Essentially independent of operating temperature.



7.1 Typical characteristic

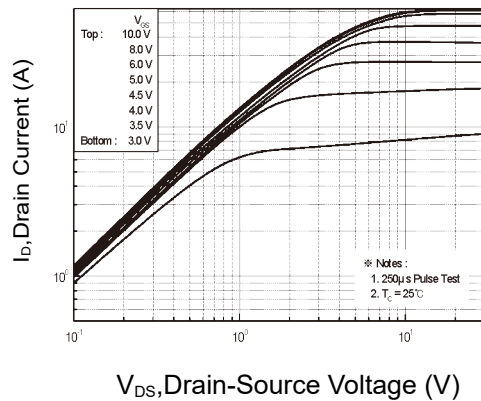


Figure 1: Output Characteristics

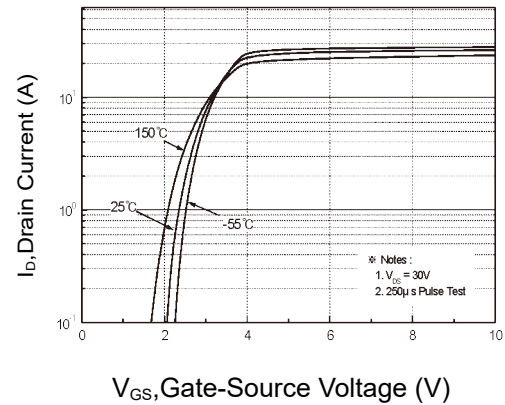


Figure 2: Transfer Characteristics

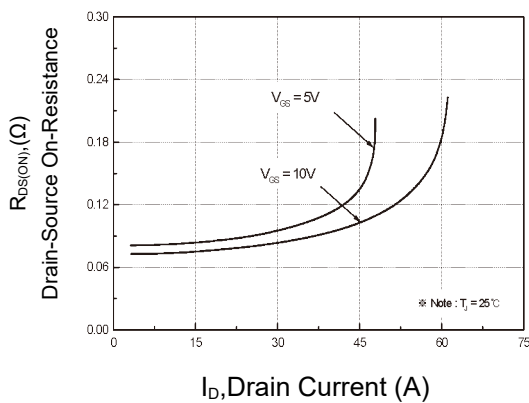


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

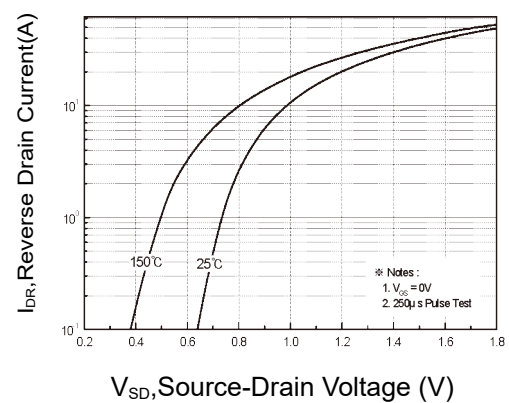


Figure 4: Body Diode Forward Voltage Variation vs. Source Current and Temperature

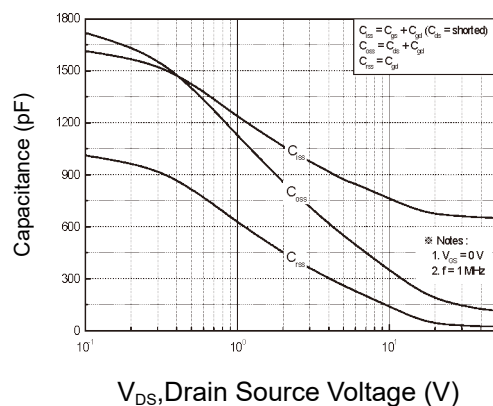


Figure 5: Capacitance Characteristics

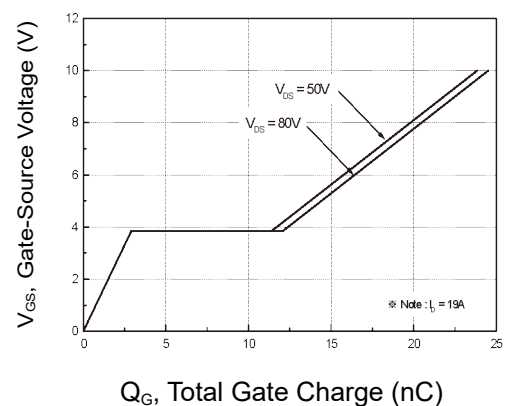


Figure 6: Gate Charge Characteristics



7.2 Typical characteristic

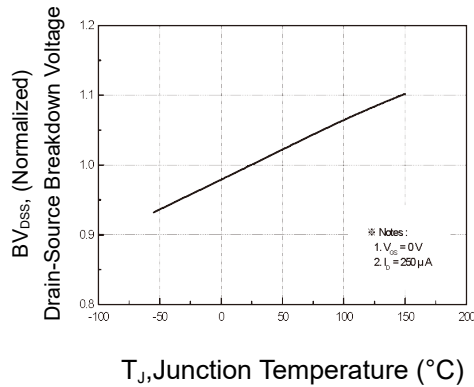


Figure 7: SBreakdown Voltage Variation vs. Temperature

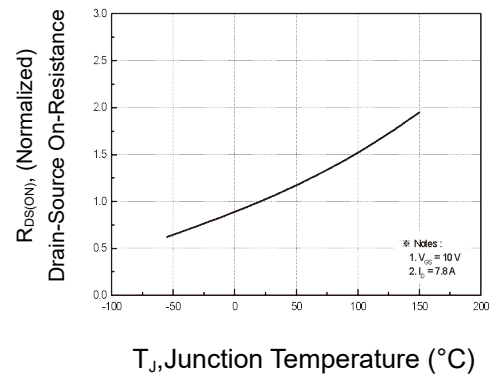


Figure 8: On-Resistance Variation vs. Temperature

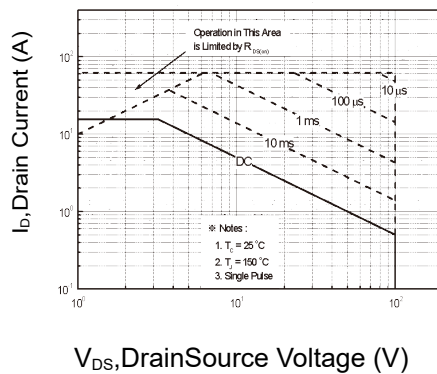


Figure 9: Maximum Safe Operating Area

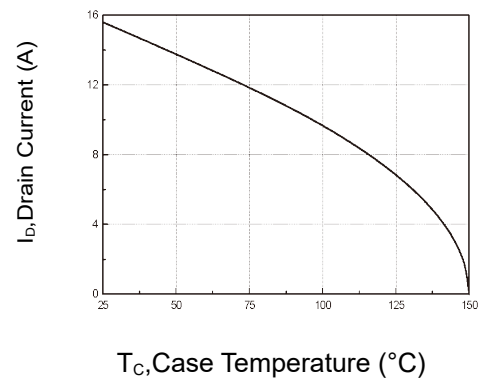


Figure 10: Maximum Drain Current vs. Case Temperature

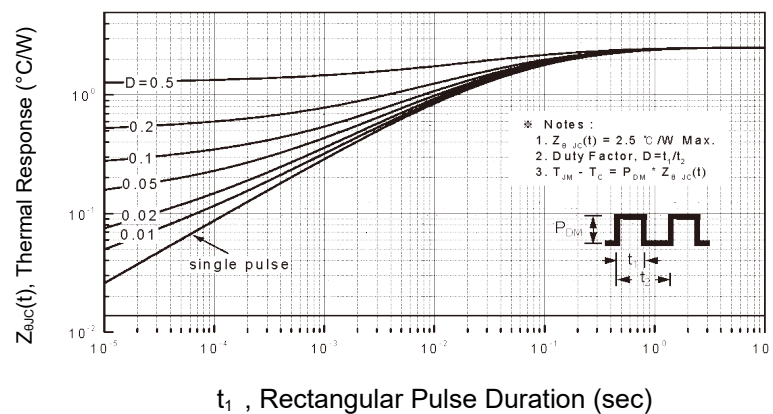
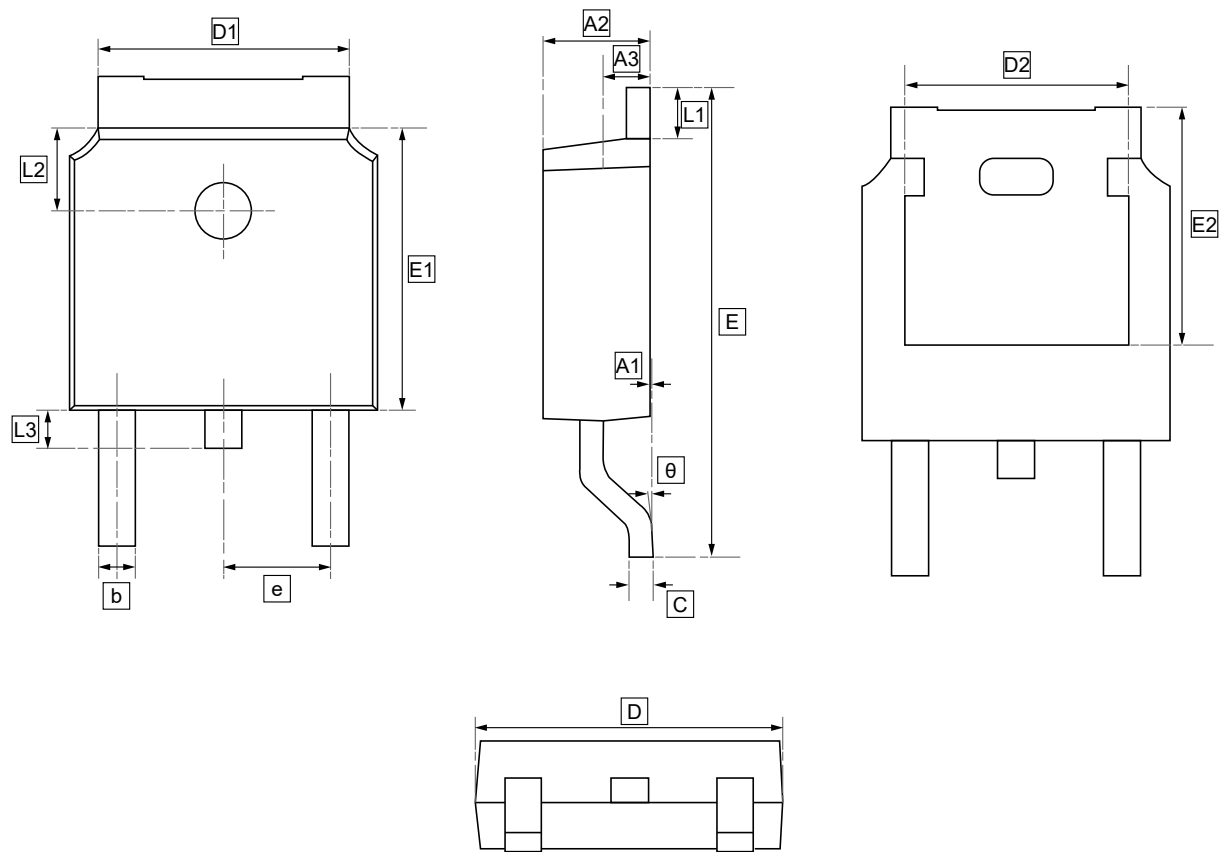


Figure 11: Transient Thermal Response Curve



8.TO-252 Package Outline Dimensions

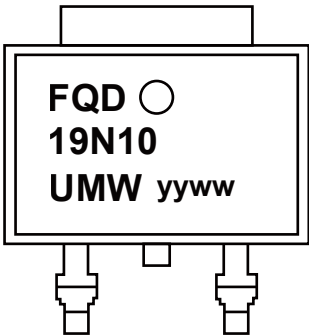


DIMENSIONS (mm are the original dimensions)

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 FQD19N10LTM	TO-252	2500	Tape and reel



10.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

When applying our products, please do not exceed the maximum rated values, as this may affect the reliability of the entire system. Under certain conditions, any semiconductor product may experience faults or failures. Buyers are responsible for adhering to safety standards and implementing safety measures during system design, prototyping, and manufacturing when using our products to prevent potential failure risks that could lead to personal injury or property damage.

Unless explicitly stated in writing, UMW products are not intended for use in medical, life-saving, or life-sustaining applications, nor for any other applications where product failure could result in personal injury or death. If customers use or sell the product for such applications without explicit authorization, they assume all associated risks.

When reselling, applying, or exporting, please comply with export control laws and regulations of China, the United States, the United Kingdom, the European Union, and other relevant countries, regions, and international organizations.

This document and any actions by UMW do not grant any intellectual property rights, whether express or implied, by estoppel or otherwise. The product names and marks mentioned herein may be trademarks of their respective owners.