

1.Description

This advanced MOSFET technology has been especially tailored to reduce on-state resistance, and to provide superior switching performance and high avalanche energy strength. These devices are suitable for switched mode power supplies, audio amplifier, DC motor control, and variable switching power applications.

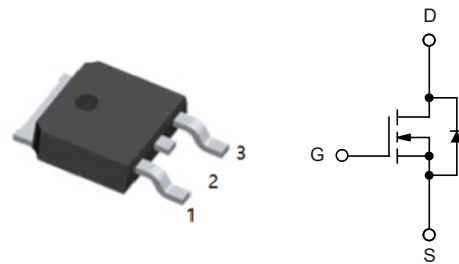
2.Features

- $V_{DS(V)}=60V$
- $I_D=45A$
- $R_{DS(ON)}<25m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}<30m\Omega(V_{GS}=4.5V)$

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}	60	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current ($T_J=175^\circ C$) ^a	$T_C=25^\circ C$	I_D	45	A
	$T_C=125^\circ C$		35	
Pulsed Drain Current		I_{DM}	100	
Continuous Source Current (Diode Conduction)		I_S	23	
Avalanche Current		I_{AS}	20	
Single Pulse Avalanche Energy (Duty Cycle $\leq 1\%$)		E_{AS}	20	mJ
Maximum Power Dissipation	$L=0.1mH$	P_D	100	W
	$T_C=25^\circ C$		3	W
Operating Junction Temperature Range		T_J, T_{STG}	-55 to 175	$^\circ C$



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5.Thermal Resistance Rating

Parameter		Symbol	Typ	Max	Units
Maximum Junction-to-Ambient	$t \leq 10s$	$R_{\theta JA}$	18	22	°C/W
	Steady-State		40	50	°C/W
Junction-to-Case		$R_{\theta JC}$	3.2	4	°C/W



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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	60			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	2	3	V
Gate-Body Leakage	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V			1	μA
		V _{DS} =60V, V _{GS} =0V, T _J =125°C			50	μA
		V _{DS} =60V, V _{GS} =0V, T _J =175°C			250	μA
On-State Drain Current ^a	I _{D(ON)}	V _{DS} =5V, V _{GS} =10V	50			A
Drain-Source On-State Resistance ^a	R _{DS(ON)}	V _{GS} =10V, I _D =15A		25	31	mΩ
		V _{GS} =10V, I _D =15A, T _J =125°C		55		mΩ
		V _{GS} =10V, I _D =15A, T _J =175°C		69		mΩ
		V _{GS} =4.5V, I _D =10A		30	45	mΩ
Forward Transconductance ^a	g _{FS}	V _{DS} =15V, I _D =15A		20		S
Dynamic ^a						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, F=1MHz		670		pF
Output Capacitance	C _{oss}			140		pF
Reverse Transfer Capacitance	C _{rss}			60		pF
Total Gate Charge ^b	Q _g	V _{DS} =30V, V _{GS} =10V, I _D =23A		11	17	nC
Gate-Source Charge ^b	Q _{gs}			3		nC
Gate-Drain Charge ^b	Q _{gd}			3		nC
Turn-On Delay Time ^b	t _{D(on)}	V _{DD} =30V, R _L =1.3Ω, I _D ≈23A		8	15	ns
Rise Time ^b	t _r			15	25	ns
Turn-Off Delay Time ^b	t _{D(off)}			30	45	ns
Fall time ^c	t _f	V _{GEN} =10V, R _G =2.5Ω		25	40	ns



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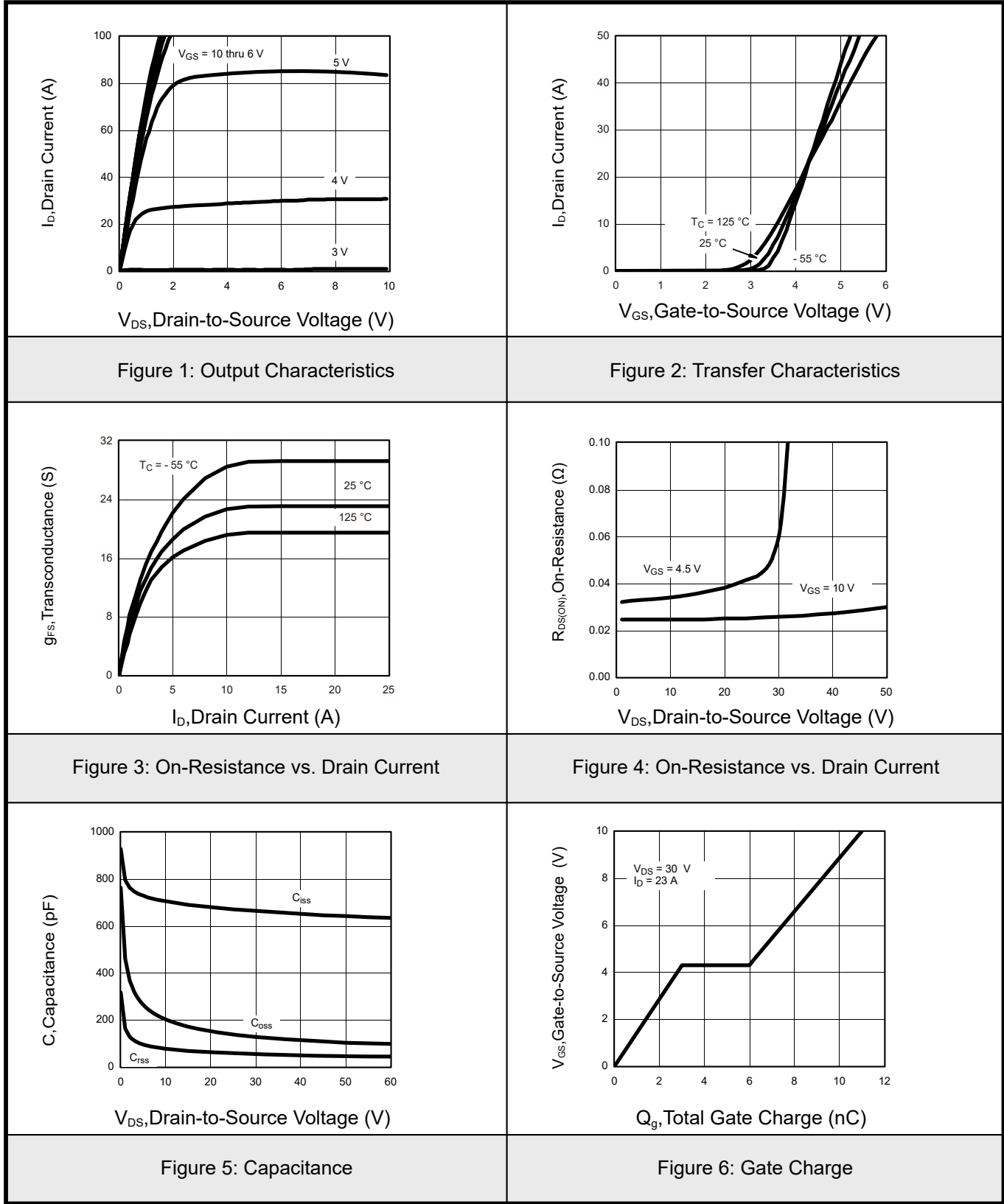
Source-Drain Diode Ratings and Characteristics (T _c =25°C)						
Pulsed Current	I _{SM}				50	A
Diode Forward Voltage	V _{SD}	I _F =15A, V _{GS} =0V		1	1.5	V
Source-Drain Reverse Recovery Time	t _{rr}	I _F =15A, dI/dt=100A/μs		30	60	ns

Notes:

- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
- b. Independent of operating temperature.



7.1 Typical Characteristics





7.2 Typical Characteristics

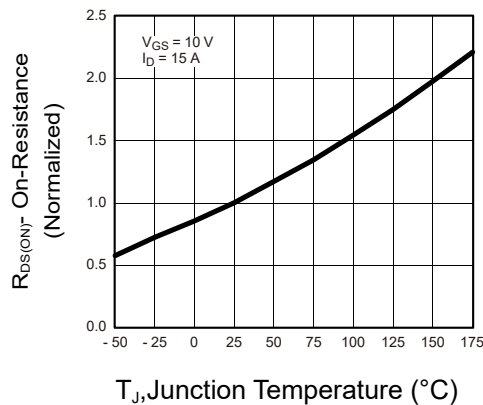


Figure 7: On-Resistance vs. Junction Temperature

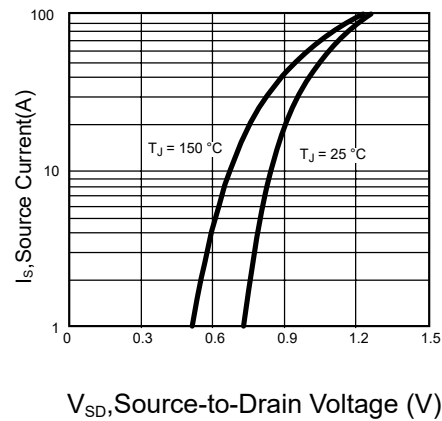


Figure 8: Source-Drain Diode Forward Voltage

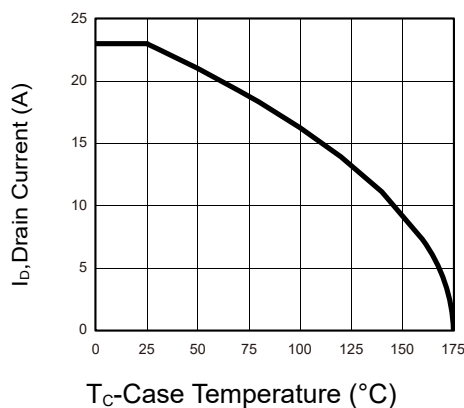
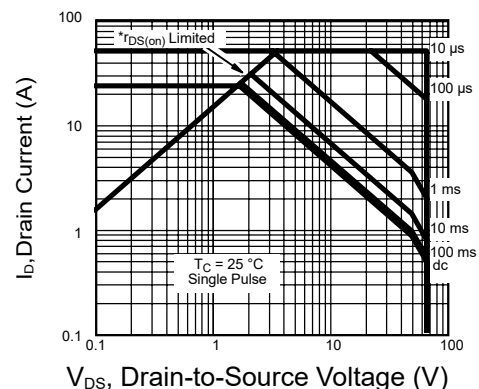


Figure 9: Maximum Avalanche Drain Current vs. Case Temperature



* $V_{GS} > \text{minimum } V_{GS} \text{ at which } R_{DS(ON)} \text{ is specified}$

Figure 10: Safe Operating Area

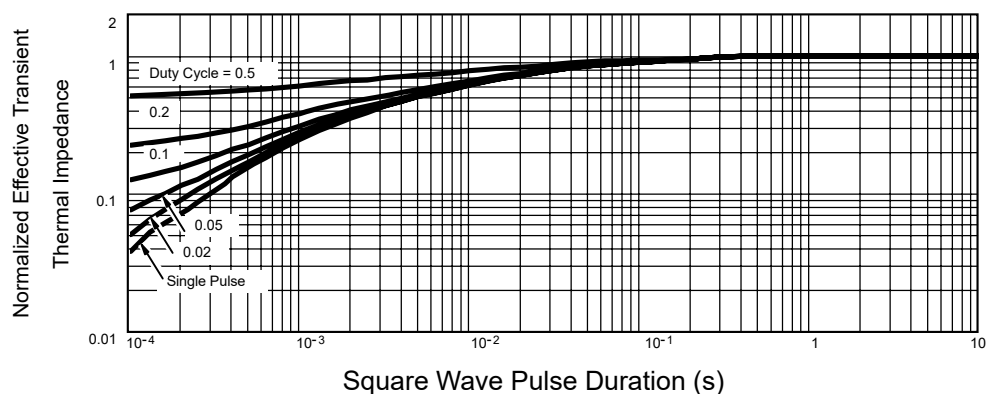
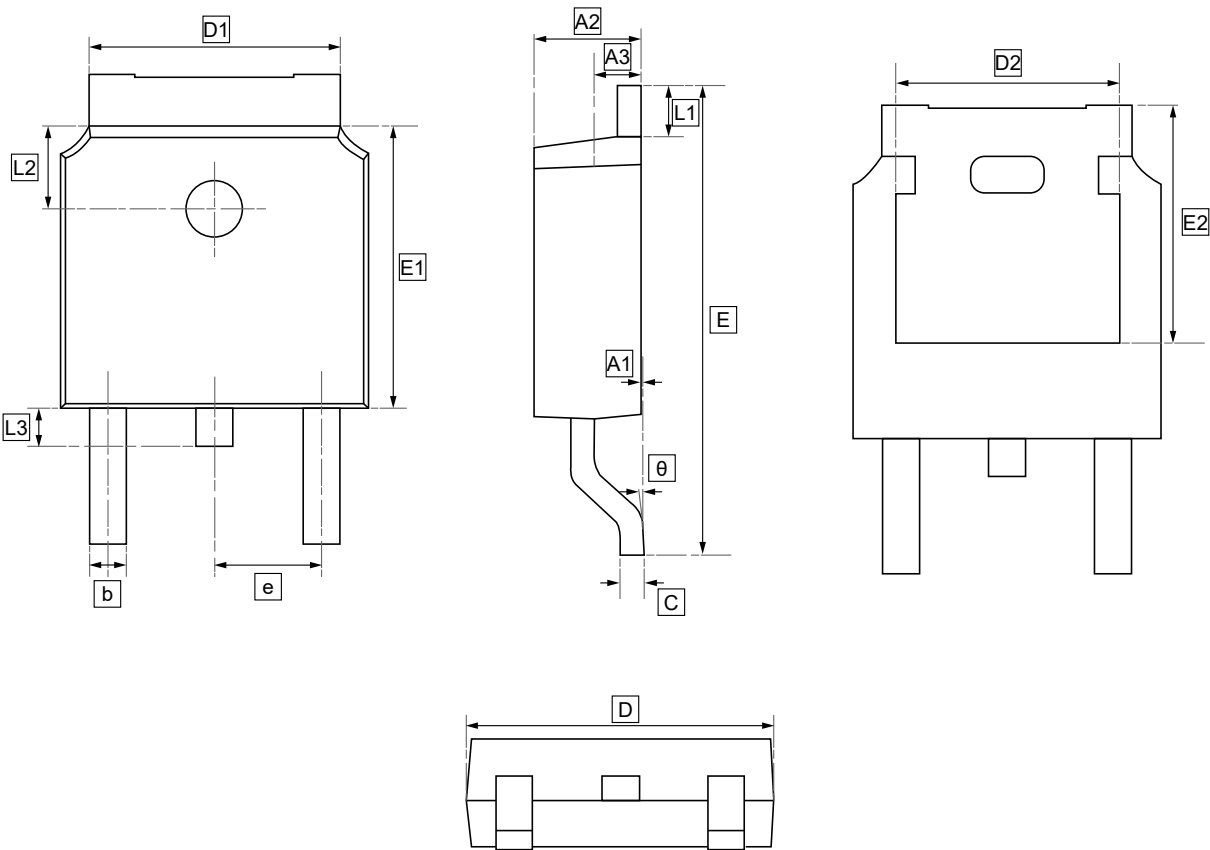


Figure 11: Normalized Thermal Transient Impedance, Junction-to-Case



8.TO-252 Package Outline Dimensions

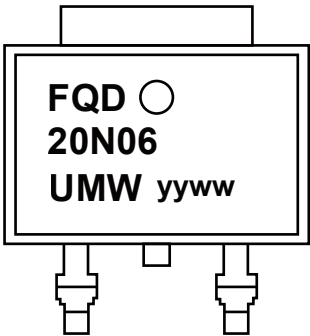


DIMENSIONS (mm are the original dimensions)

Symbol	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		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 FQD20N06	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.

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