

1.Description

This N-Channel MOSFET is produced using ductor's advanced process that has been tai-lored to minimize the on-state resistance and maintain superior switching performance.

2.2Features

- Low Gate Charge (Typ.2.78 nC)
- Fast Switching

2.1Features

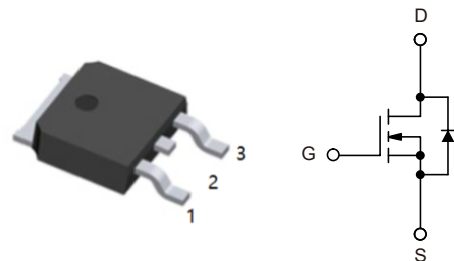
- $V_{DS(V)}=100V$
- $R_{DS(ON)}=124m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}=175m\Omega(V_{GS}=5V)$

- Improved dv/dt Capability
- RoHS Compliant

3.Pinning information

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

TO-252(DPAK)
top view



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

Parameter		Symbol	Rating	Units
Drain to Source Voltage		V_{DSS}	100	V
Gate to Source Voltage		V_{GSS}	± 20	V
Drain Current	- Continuous ($T_C=25^{\circ}C$)	I_D	6.8	A
	- Continuous ($T_C=100^{\circ}C$)		4.3	A
	- Pulsed (Note 1)	I_{DM}	13.6	A
Single Pulse Avalanche Energy (Note 2)		E_{AS}	5.08	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	6	V/ns
Drain Current	($T_C=25^{\circ}C$)	P_D	14.9	W
	- Derate Above $25^{\circ}C$		0.12	W/ $^{\circ}C$
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^{\circ}C$
Maximum Lead Temperature for Soldering, 1/8" from Case for 5 Seconds		T_L	300	$^{\circ}C$



5.Thermal Characteristics

Parameter	Symbol	Rating	Units
Thermal Resistance, Junction to Case, Max	$R_{\theta JC}$	8.4	°C/W
Thermal Resistance, Junction to Ambient, Max	$R_{\theta JA}$	87	°C/W



6. Electrical Characteristic (T_c=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Off Characteristics						
Drain to Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	100			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	I _D =250μA Referenced to 25°C		0.1		V/°C
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =80V, V _{GS} =0V			1	μA
		V _{DS} =80V,V _{GS} =0V,T _C =125°C			500	μA
Gate to Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±10	μA
On Characteristics						
Gate to Source Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.6	2.5	V
Static Drain to Source On Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =3.4A		124	160	mΩ
		V _{GS} =5V, I _D =2.1A		175	375	mΩ
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =6.8A		19.6		S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f=1MHz		169	225	pF
Output Capacitance	C _{oss}			43	55	pF
Reverse Transfer Capacitance	C _{rss}			2.04		pF
Energy Related Output Capacitance	C _{oss(er)}	V _{DS} =50V, V _{GS} =0V		85		pF
Total Gate Charge at 10V	Q _{g(TOT)}	V _{GS} =10V	V _{DD} =50V I _D =6.8A	2.78	3.61	nC
Total Gate Charge at 5V	Q _{g(TOT)}	V _{GS} =5V		1.5	1.95	nC
Gate to Source Gate Charge	Q _{gs}	(Note 4)		0.72		nC
Gate to Drain “Miller” Charge	Q _{gd}			0.56		nC
Gate Plateau Volatge	V _{plateau}			4.02		V
Total Gate Charge Sync.	Q _{sync}	V _{DS} =0V, I _D =3.4A		2.5		nC
Output Charge	Q _{oss}	V _{DS} =50V, V _{GS} =0V		5.2		nC
Equivalent Series Resistance (G-S)	E _{SR}	f=1MHz		2.1		Ω



Switching Characteristics						
Turn-On Delay Time	$t_{D(on)}$	$V_{DD}=50V, I_D=6.8V$ $V_{GS}=10V, R_g=4.7\Omega$ (Note 4)		7	24	ns
Turn-On Rise Time	t_r			2	14	ns
Turn-Off Delay Time	$t_{D(off)}$			13	36	ns
Turn-Off Fall Time	t_f			2	14	ns
Drain-Source Body Diode Characteristics						
Maximum Continuous Drain to Source Diode Forward Current	I_S				6.8	A
Maximum Pulsed Drain to Source Diode Forward Current	I_{SM}				13.6	A
Drain to Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{SD}=6.8A$			1.3	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_{SD}=6.8A, V_{DS}=50V$		37		ns
Reverse Recovery Charge	Q_{rr}	$dl_F/dt=100A/\mu s$		42		nC

Notes:

1. Repetitive rating: pulse-width limited by maximum junction temperature.
2. $L=1mH, I_{AS}=3.18A, R_G=25\Omega$, starting $T_J=25^\circ C$.
3. $I_{SD} \leq 6.8A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$, starting $T_J=25^\circ C$.
4. Essentially independent of operating temperature typical characteristics.



7.1 Typical characteristic

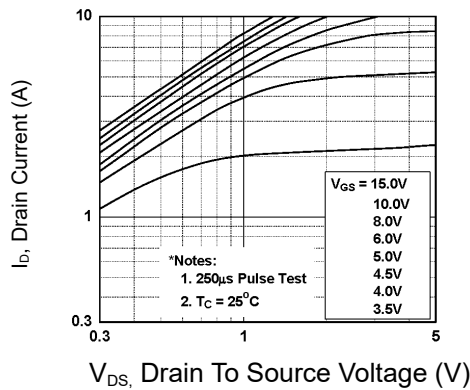


Figure 1: On-Region Characteristics

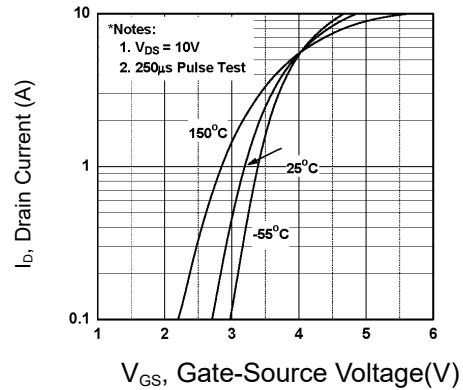


Figure 2: Transfer Characteristics

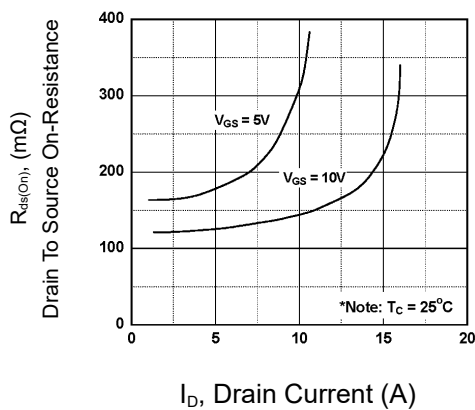


Figure 3: On-Resistance Variation vs. Drain Current and Gate Voltage

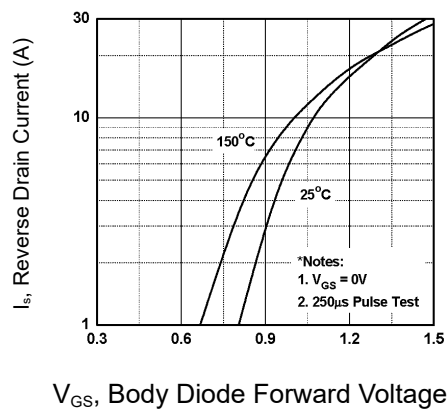


Figure 4: Body Diode Forward Voltage Variation vs. Source Current and Temperature

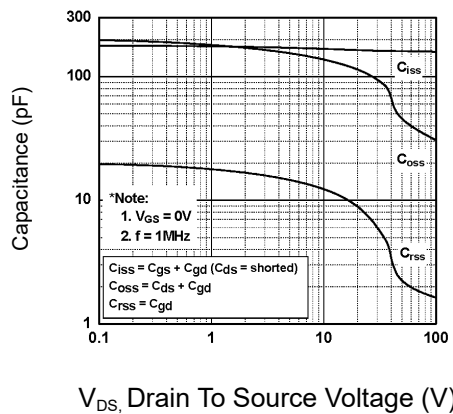


Figure 5: Capacitance Characteristics

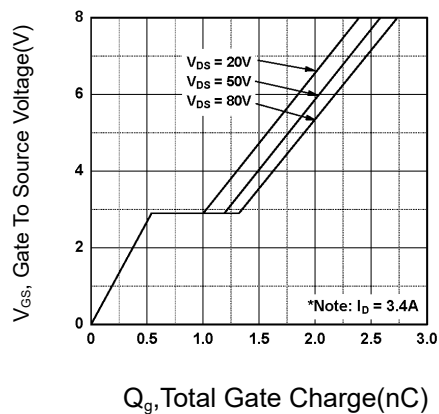


Figure 6: Gate Charge Characteristics



7.2Typical characteristic

Figure 7: Breakdown Voltage Variation vs. Temperature	Figure 8: On-Resistance Variation vs. Temperature
Figure 9: Maximum Safe Operating Area	Figure 10: Maximum Continuous Drain Current vs Case Temperature
Figure 11: Eoss vs. Drain to Source Voltage	Figure 12: Unclamped Inductive Switching Capability



7.3Typical characteristic

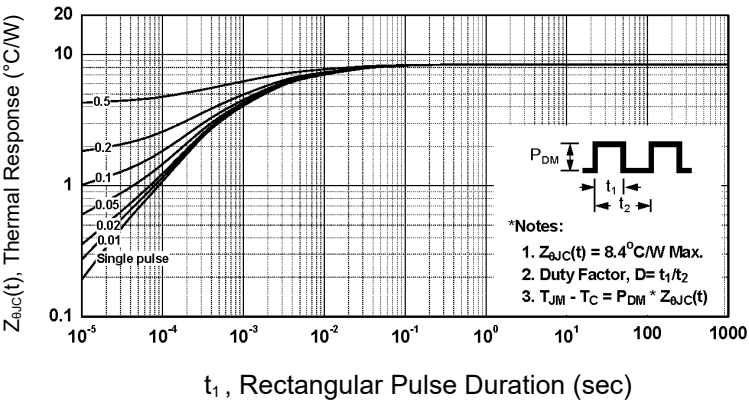
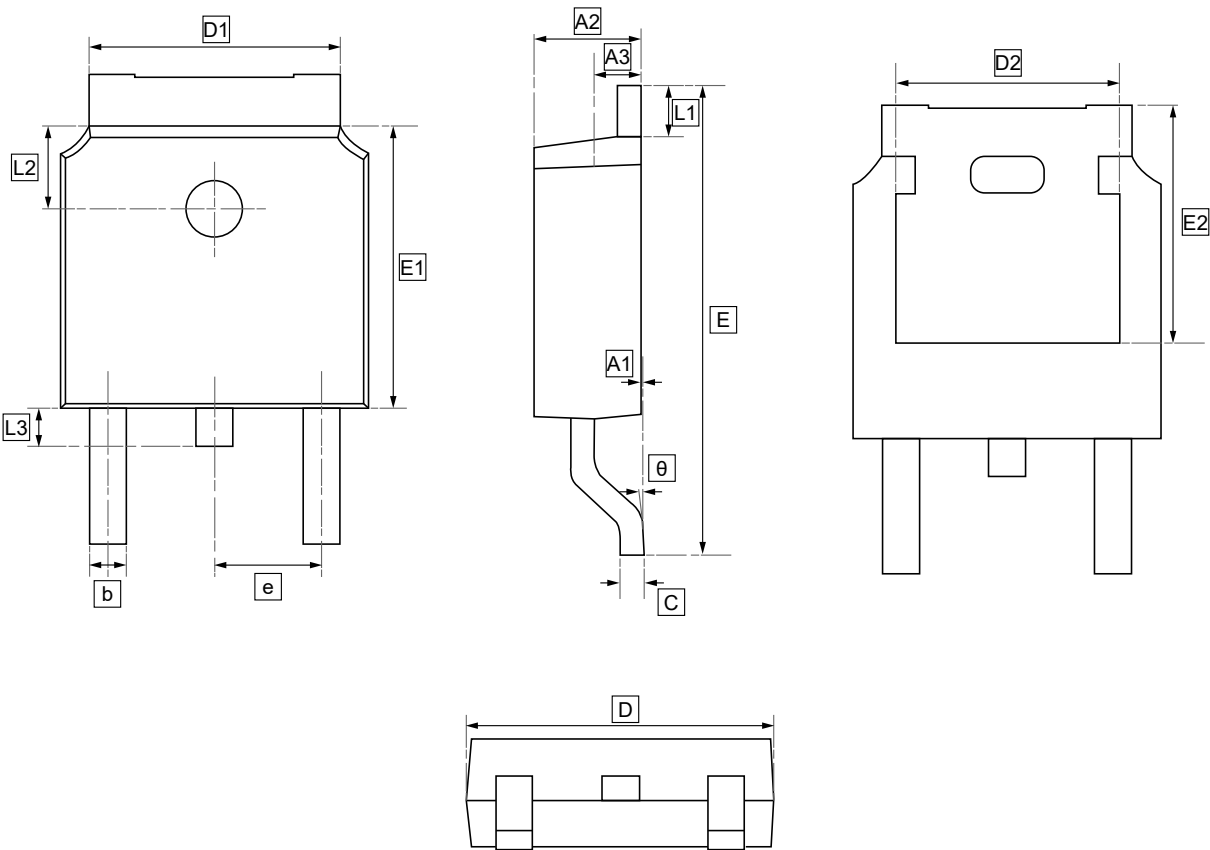


Figure 13: Transient Thermal Response Curve



8.TO-252 Package Outline Dimensions

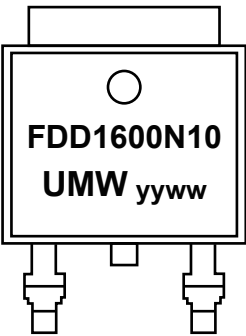


DIMENSIONS (mm are the original dimensions)

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 FDD1600N10ALZ	TO-252	2500	Tape and reel



10.Disclaimer

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