

1.Features

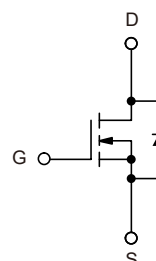
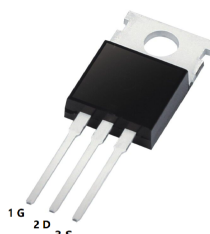
- $V_{DS(V)}=40V$
- $I_D=277A$
- $R_{DS(ON)}<2.2m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}<2.4m\Omega(V_{GS}=4.5V)$
- Low Miller Charge
- Low Q_{rr} Body Diode

2.Applications

- Power Tools
- Synchronous Rectification
- Battery Protection Circuit
- Motor Drives and Uninterruptible Power Supplies

3.Pinning information

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



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

Parameter		Symbol	Rating	Units
Drain to Source Voltage		V_{DSS}	40	V
Gate to Source Voltage		V_{GSS}	± 20	V
Drain Current	- Continuous($T_c=25^{\circ}C$, Silicon Limited)	I_D	277*	A
	- Continuous($T_c=100^{\circ}C$, Silicon Limited)		196*	A
	- Continuous($T_c=25^{\circ}C$, Package Limited)		100	A
	- Pulsed (Note 1)	I_{DM}	500	A
Single Pulse Avalanche Energy (Note 2)		E_{AS}	1682	mJ
Power Dissipation	($T_c=25^{\circ}C$)	P_D	306	W
	- Derate above $25^{\circ}C$		2.04	W/ $^{\circ}C$
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to 175	$^{\circ}C$
Maximum Lead Temperature for Soldering Purpose, 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.	$R_{\theta JC}$	0.49	°C/W
Thermal Resistance, Case to Sink (Typ.)	$R_{\theta JS}$	0.5	°C/W
Thermal Resistance, Junction to Ambient, Max.	$R_{\theta JA}$	62.5	°C/W



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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain to Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	40			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =32V			1	μA
		V _{GS} =0V, T _C =150°C			250	μA
Gate to Body Leakage Current	I _{GSS}	V _{GS} =±20V			±100	nA
Gate to Source Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1		3	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =80A		1.88	2.4	mΩ
		V _{DS} =10V, I _D =80A		1.64	2.2	mΩ
		V _{DS} =10V, I _D =80A, T _C =175°C		3.00	4.4	mΩ
Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz		18600	24740	pF
output capacitance	C _{oss}			1840	2450	pF
Reverse Transfer Capacitance	C _{rss}			1400	2100	pF
Gate Resistance	R _g	V _{GS} =0.5V, f=1MHz		1.1		Ω
Total Gate Charge at 10V	Q _{g(tot)}	V _{GS} =0V to 10V	V _{DD} =20V I _D =80A I _g =1mA	345	450	nC
Threshold Gate Charge	Q _{g(2)}	V _{GS} =0V to 2V		32.5		nC
Gate to Source Gate Charge	Q _{gs}			49		nC
Gate Charge Threshold to Plateau	Q _{gs2}			16.5		nC
Gate to Drain "Miller" Charge	Q _{gd}			74		nC
Turn-On Time	t _{on}	V _{DD} =20V, I _D =80A V _{GS} =10V, R _{GEN} =7Ω		175	360	ns
Turn-On Delay Time	t _{D(on)}			43	95	ns
Rise Time	t _r			130	275	ns
Turn-Off Delay Time	t _{D(off)}			435	875	ns
Fall Time	t _f			290	590	ns
Turn-Off Time	t _{off}			730	1470	ns
Source to Drain Diode Voltage	V _{SD}	I _{SD} =80A			1.25	V
		I _{SD} =40A			1	V
Reverse Recovery Time	t _{rr}	I _{SD} =75A, dI _{SD} /dt=100A/μs		59		ns
Reverse Recovery Charge	Q _{rr}	I _{SD} =75A, dI _{SD} /dt=100A/μs		77		nC

1: Pulse width limited by maximum junction temperature. 2: Starting T_J=25°C, L=1mH, I_{AS}=58A, V_{DD}=36V, V_{GS}=10V.



7.1 Typical characteristic

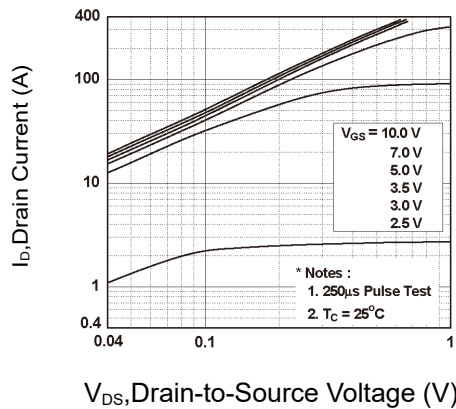


Figure 1: On-Region Characteristics

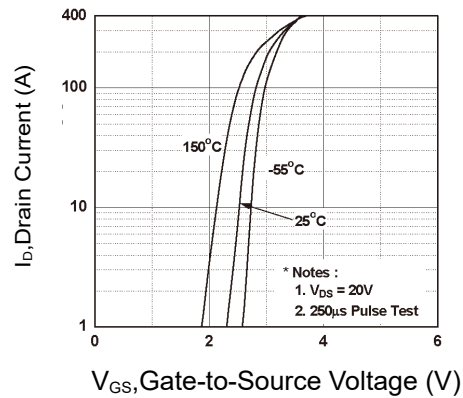


Figure 2: Transfer Characteristics

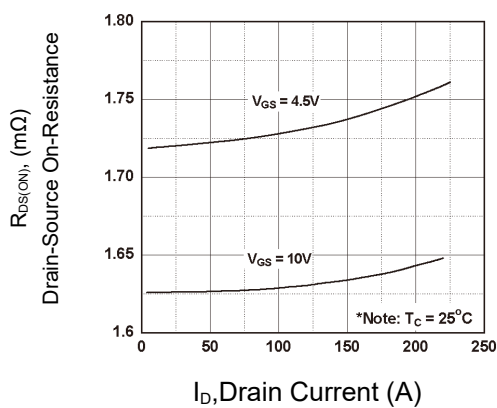


Figure 3: On - resistance variation and drain current

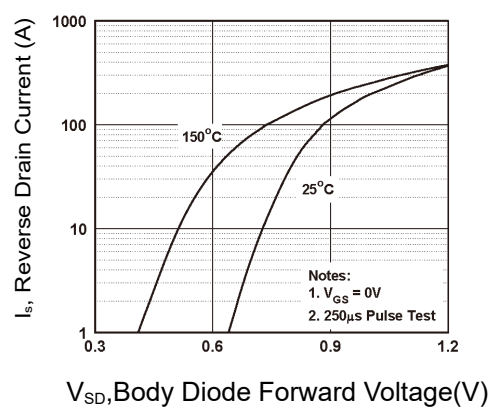


Figure 4: Body Diode Forward Voltage Variation vs. Source Current and Temperature

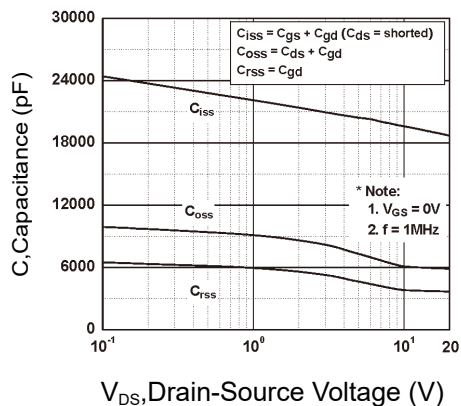


Figure 5: Capacitance Characteristics

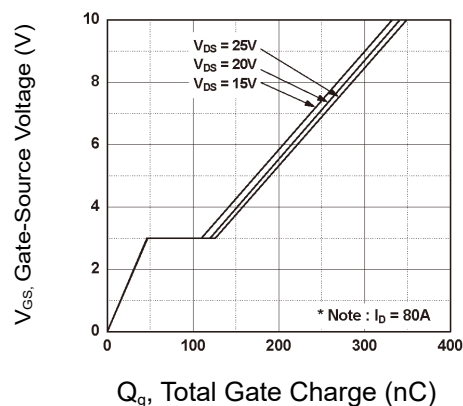


Figure 6: Gate Charge Characteristics



7.2 Typical characteristic

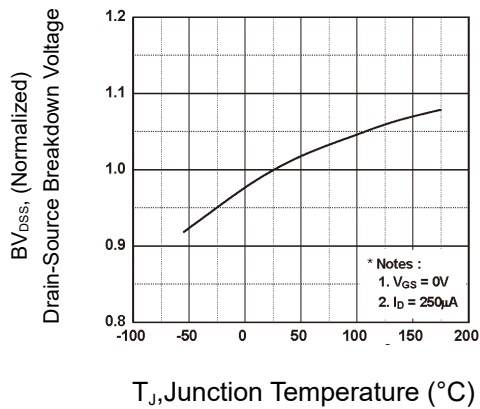


Figure 7: Breakdown Voltage Variation vs. Temperature

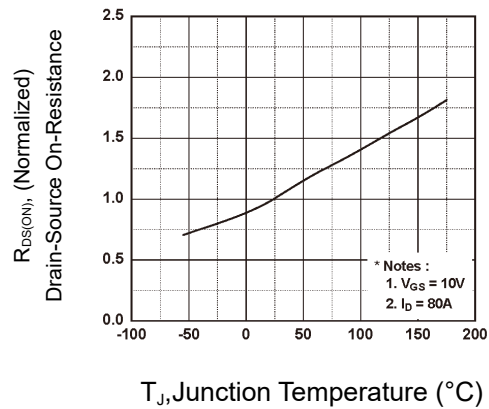


Figure 8: On-Resistance Variation vs. Temperature

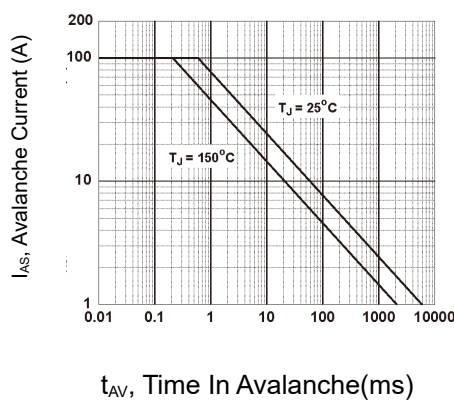


Figure 9: Unclamped Inductive Switching Capability

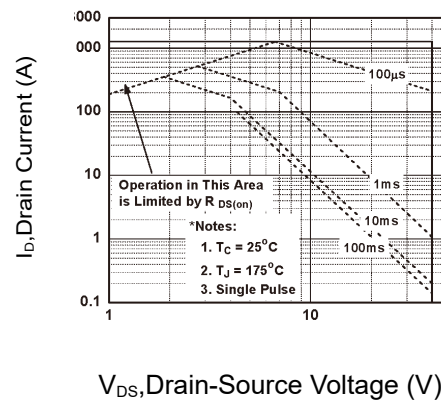


Figure 10: Safe Operating Area

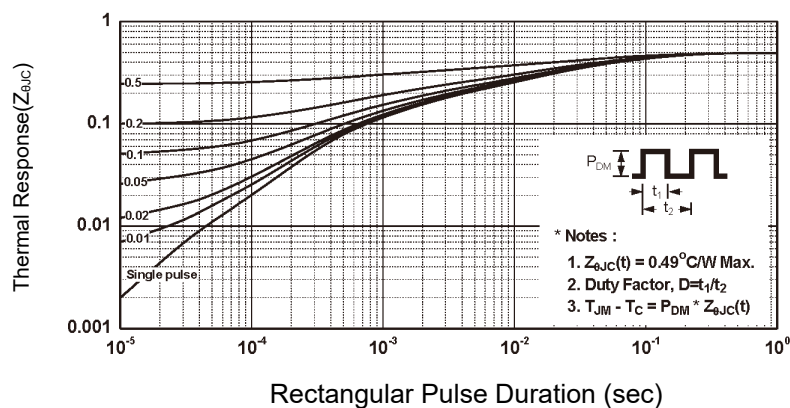
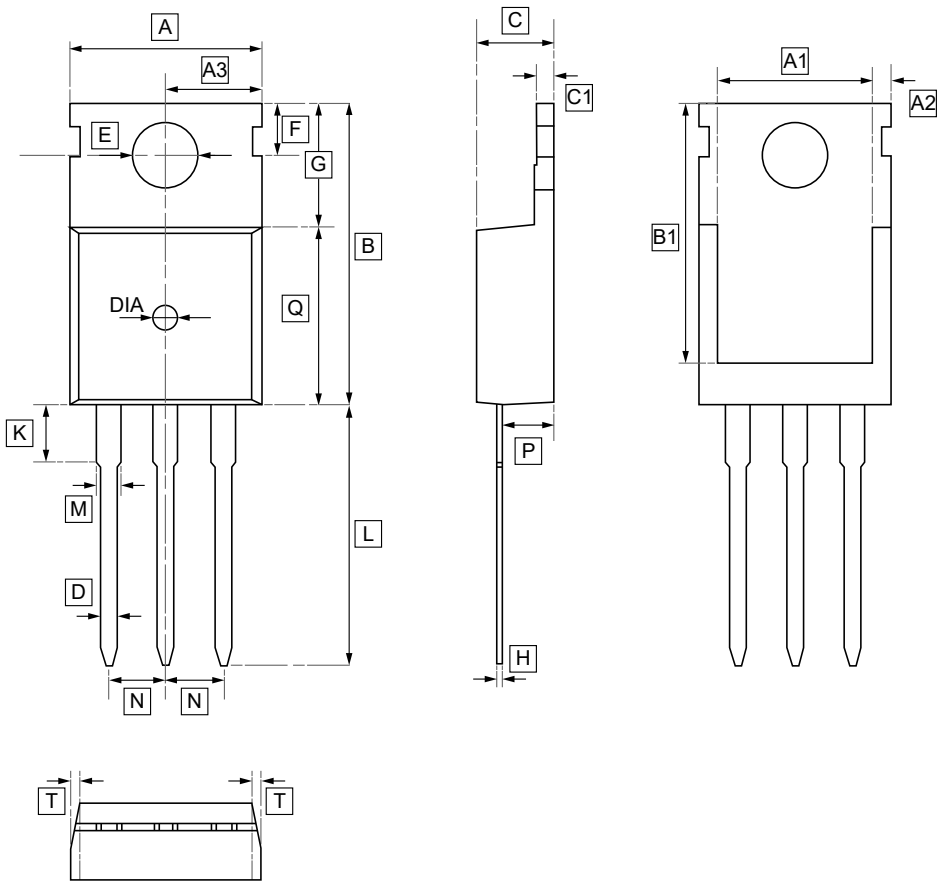


Fig 11: Transient Thermal Response Curve



8.1 TO-220 Package Outline Dimensions



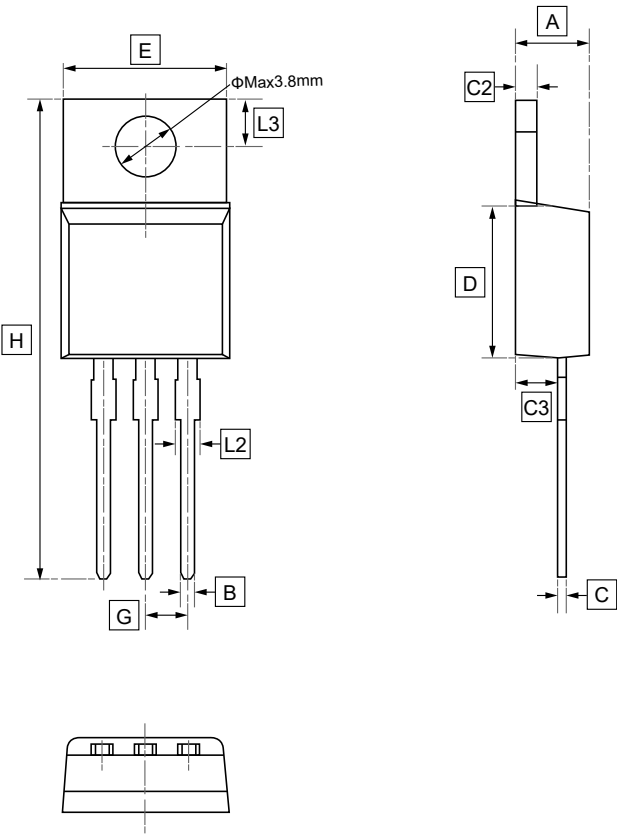
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	B	B1	C	C1	D	E	F	G
Min	9.7	8.44	1.05	4.8	15.4	12.9	4.28	1.1	0.6	3.4	2.65	5.2
Max	10.3	8.84	1.25	5.2	16.2	13.5	4.68	1.5	1.0	3.8	3.25	5.8

Symbol	H	K	L	L1	M	N	P	Q	T	DIA
Min	0.4	2.9	12.8	2.7	1.15	2.49	2.1	8.7	W:0.35	⌀1.5
Max	0.6	3.3	13.6	3.3	1.35	2.59	2.7	9.3		(deep 0.2)



8.2 TO-220 Package Outline Dimensions

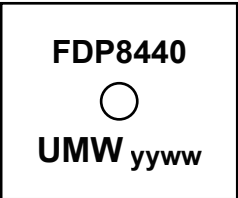


DIMENSIONS (mm are the original dimensions)

Symbol	A	B	C	C2	C3	D	E	G	H	L2	L3
Min	4.30	0.60	0.28	1.17	2.30	8.80	9.80	2.44	28.55	1.10	2.59
Max	4.70	1.00	0.48	1.37	2.70	9.20	10.20	2.64	29.15	1.50	2.89



9.Ordering Information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW FDP8440	TO-220	1000	Tube and box



10.Disclaimer

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