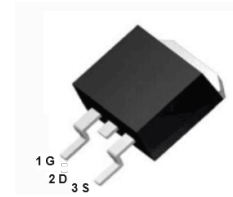


Features

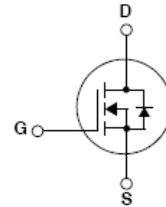
- $V_{DS}(V) = 30V$
- $I_D = 80A$ ($V_{GS} = 10V$)
- $R_{DS(ON)} < 1.9m\Omega$ ($V_{GS} = 10V$)
- $R_{DS(ON)} < 2.2m\Omega$ ($V_{GS} = 4.5V$)
- Low Miller Charge
- Low Q_{rr} Body Diode
- UIS Capability (Single Pulse and Repetitive Pulse)



TO - 263

Applications

- Starter / Alternator Systems
- Electronic Power Steering Systems
- DC-DC Converters



MOSFET Maximum Ratings $T_C = 25^\circ C$ unless otherwise noted

Symbol	Parameter	Ratings	Units
V_{DSS}	Drain to Source Voltage	30	V
V_{GS}	Gate to Source Voltage	± 20	V
I_D	Drain Current Continuous ($T_C < 165^\circ C$, $V_{GS} = 10V$)	80	A
	Drain Current Continuous ($T_C < 163^\circ C$, $V_{GS} = 5V$)	80	
	Drain Current Continuous ($T_{amb} = 25^\circ C$, $V_{GS} = 10V$, with $R_{\theta JA} = 43^\circ C/W$)	34	
	Pulsed	See Figure 4	
E_{AS}	Single Pulse Avalanche Energy (Note 1)	1246	mJ
P_D	Power Dissipation	300	W
	Derate above $25^\circ C$	2	W/ $^\circ C$
T_J, T_{STG}	Operating and Storage Temperature	-55 to +175	$^\circ C$

$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.5	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 2)	62	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient, $1in^2$ copper pad area	43	$^\circ C/W$

Electrical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
B_{VDSS}	Drain to Source Breakdown Voltage	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	30			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 24\text{V}$ $V_{GS} = 0\text{V}$ $T_J = 150^\circ\text{C}$			1 250	μA
I_{GSS}	Gate to Source Leakage Current	$V_{GS} = \pm 20\text{V}$			± 100	nA
$V_{GS(th)}$	Gate to Source Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$	1.0	1.6	3.0	V
$r_{DS(on)}$	Drain to Source On Resistance	$I_D = 80\text{A}$, $V_{GS} = 10\text{V}$		1.4	1.9	m Ω
		$I_D = 80\text{A}$, $V_{GS} = 5\text{V}$		1.5	2.1	
		$I_D = 80\text{A}$, $V_{GS} = 4.5\text{V}$		1.6	2.2	
C_{iss}	Input Capacitance	$V_{DS} = 15\text{V}$, $V_{GS} = 0\text{V}$, $f = 1\text{MHz}$		11400		pF
C_{oss}	Output Capacitance			2140		pF
C_{rss}	Reverse Transfer Capacitance			1260		pF
R_G	Gate Resistance	$V_{GS} = 0.5\text{V}$, $f = 1\text{MHz}$		1.2		Ω
$Q_{g(TOT)}$	Total Gate Charge at 10V	$V_{GS} = 0$ to 10V	$V_{DD} = 15\text{V}$ $I_D = 80\text{A}$ $I_g = 1.0\text{mA}$	204	265	nC
$Q_{g(5)}$	Total Gate Charge at 5V	$V_{GS} = 0$ to 5V		100	130	nC
$Q_{g(TH)}$	Threshold Gate Charge	$V_{GS} = 0$ to 1V		10.9	14.2	nC
Q_{gs}	Gate to Source Gate Charge			33		nC
Q_{gs2}	Gate Charge Threshold to Plateau			22		nC
Q_{gd}	Gate to Drain "Miller" Charge			43		nC
$t_{(on)}$	Turn-On Time	$V_{DD} = 15\text{V}$, $I_D = 80\text{A}$ $V_{GS} = 5\text{V}$, $R_{GS} = 1.5\Omega$			155	ns
$t_{d(on)}$	Turn-On Delay Time			24		ns
t_r	Turn-On Rise Time			73		ns
$t_{d(off)}$	Turn-Off Delay Time			54		ns
t_f	Turn-Off Fall Time			38		ns
t_{off}	Turn-Off Time				149	ns
V_{SD}	Source to Drain Diode Voltage	$I_{SD} = 75\text{A}$		0.8	1.25	V
		$I_{SD} = 40\text{A}$		0.8	1.0	V
t_{rr}	Reverse Recovery Time	$I_F = 75\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$		59	77	ns
Q_{rr}	Reverse Recovery Charge	$I_F = 75\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$		67	87	nC

Notes:

- 1: Starting $T_J = 25^\circ\text{C}$, $L = 0.61\text{mH}$, $I_{AS} = 64\text{A}$, $V_{DD} = 30\text{V}$, $V_{GS} = 10\text{V}$.
- 2: Pulse width = 100s.

Typical Characteristics

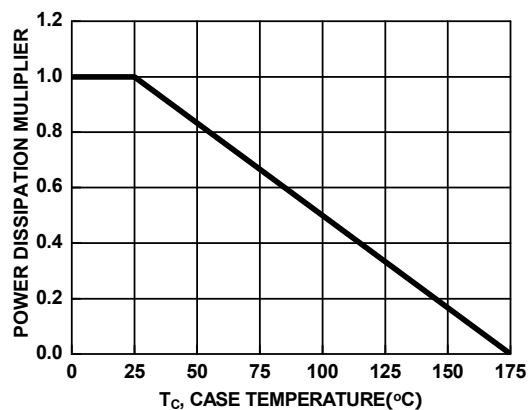


Figure 1. Normalized Power Dissipation vs Case Temperature

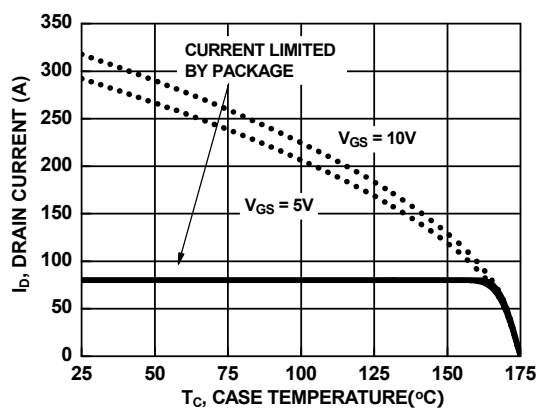


Figure 2. Maximum Continuous Drain Current vs Case Temperature

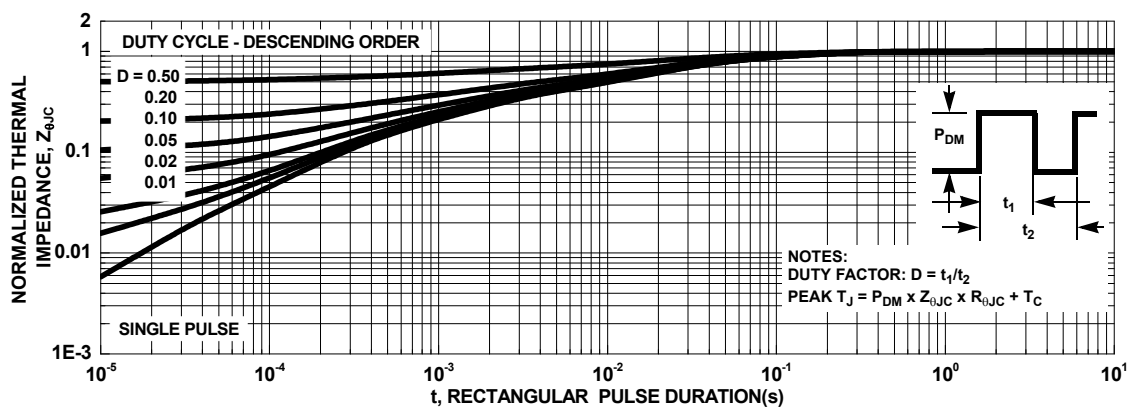


Figure 3. Normalized Maximum Transient Thermal Impedance

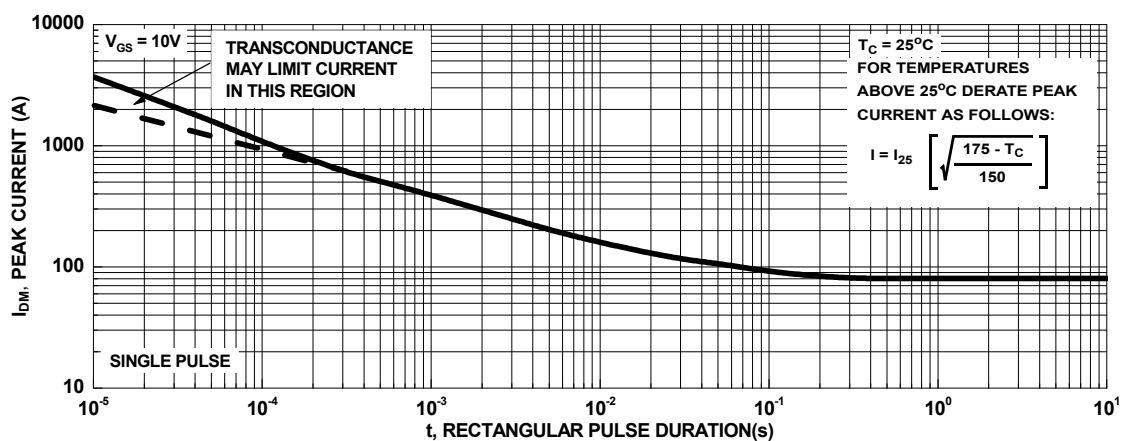


Figure 4. Peak Current Capability

Typical Characteristics

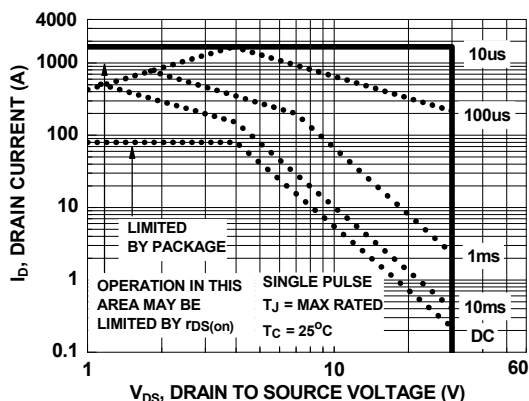
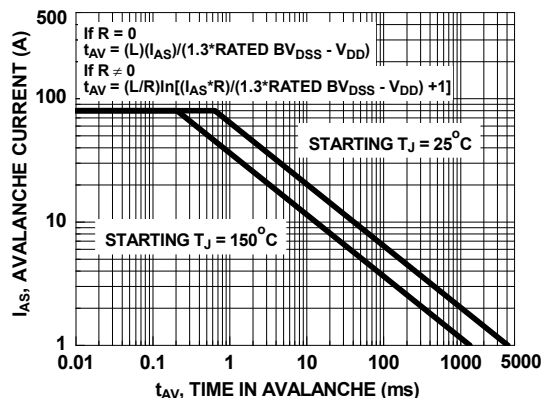


Figure 5. Forward Bias Safe Operating Area



NOTE: Refer to Fairchild Application Notes AN7514 and AN7515

Figure 6. Unclamped Inductive Switching Capability

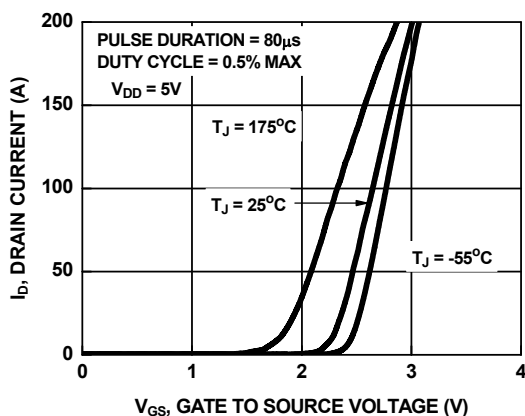


Figure 7. Transfer Characteristics

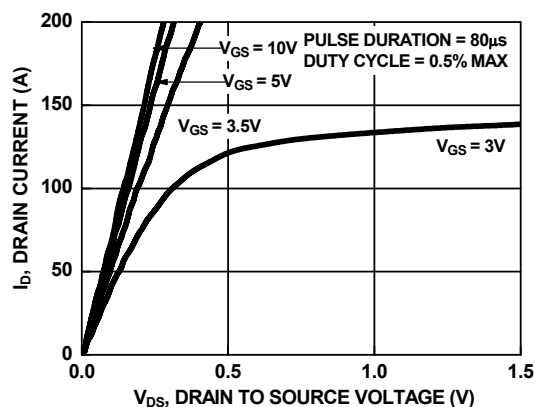


Figure 8. Saturation Characteristics

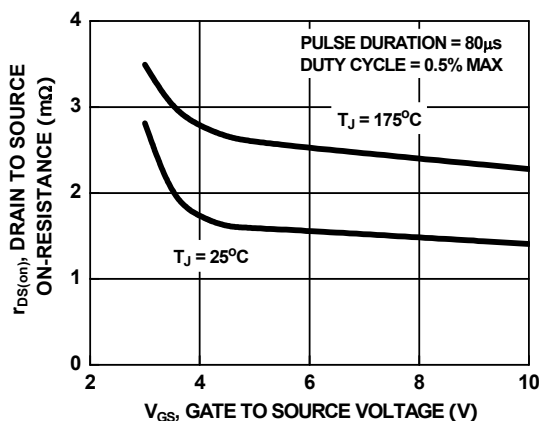


Figure 9. Drain to Source On-Resistance Variation vs Gate to Source Voltage

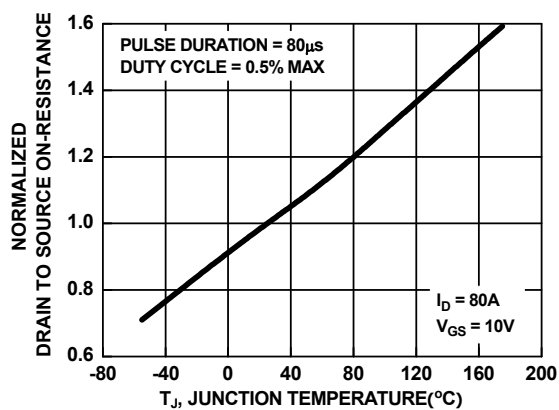


Figure 10. Normalized Drain to Source On-Resistance vs Junction Temperature

Typical Characteristics

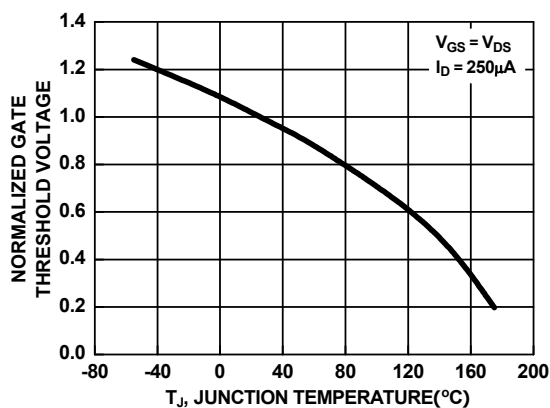


Figure 11. Normalized Gate Threshold Voltage vs Junction Temperature

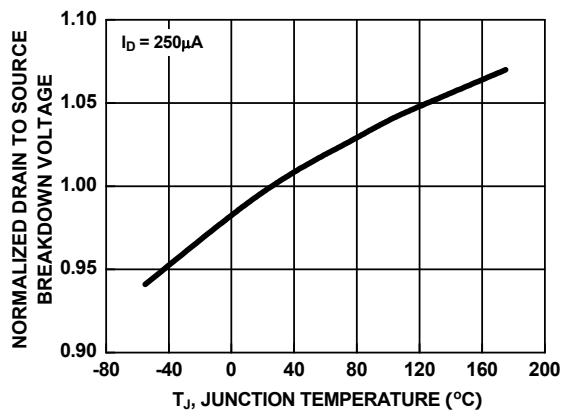


Figure 12. Normalized Drain to Source Breakdown Voltage vs Junction Temperature

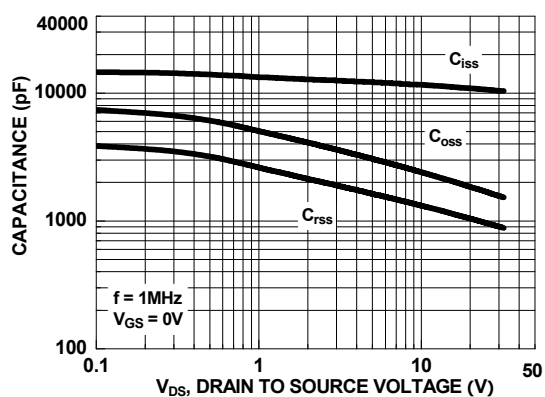


Figure 13. Capacitance vs Drain to Source Voltage

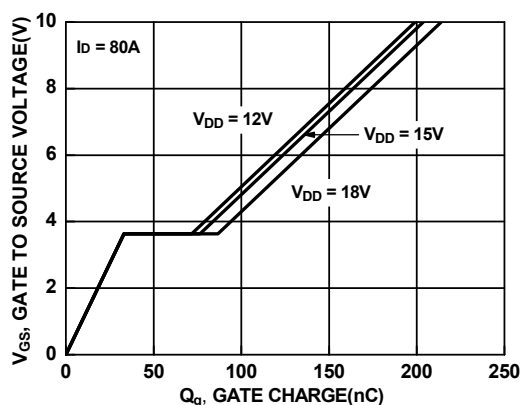
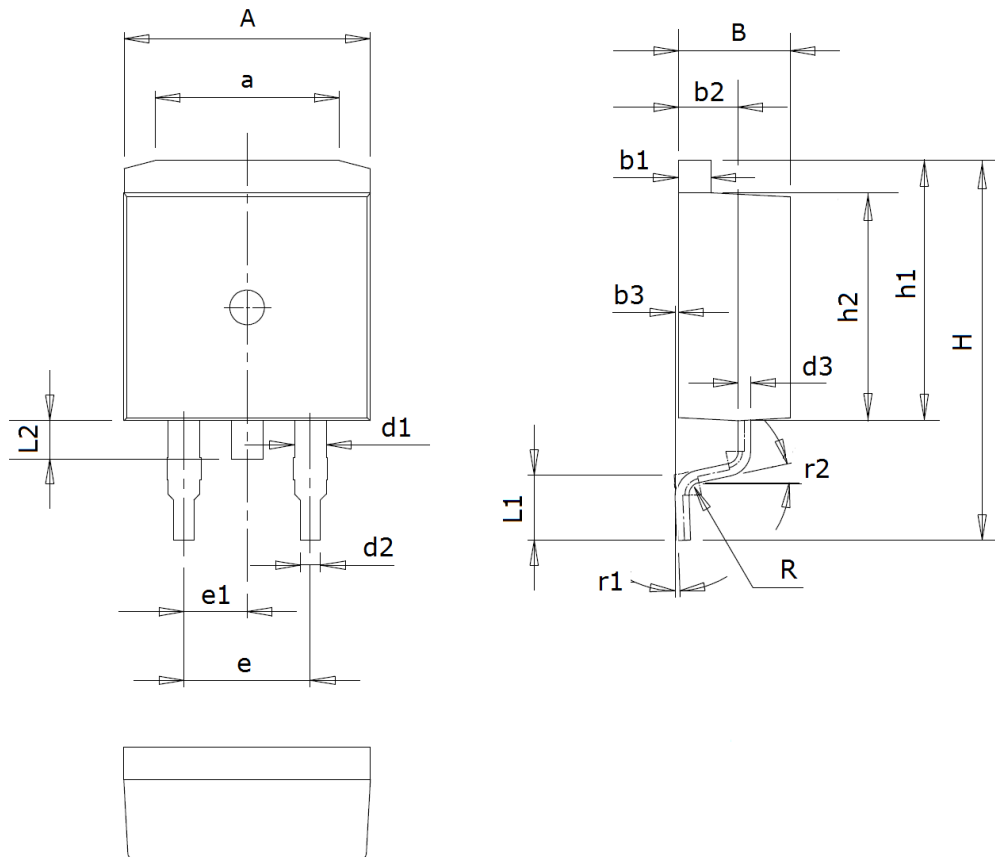


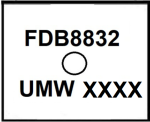
Figure 14. Gate Charge vs Gate to Source Voltage

TO-263 Package Outline Drawing



Symbol	Dimensions (mm)	Symbol	Dimensions (mm)	Symbol	Dimensions (mm)
A	9.7~10.3	d2	0.7~0.9	L1	2.4~2.9
a	7.0~7.8	d3	0.4~0.6	L2	1.3~1.8
B	4.3~4.7	e	5.08 (typ)	R	0.5(typ)
b1	1.25~1.35	e1	2.54 (typ)	r1	0~8°
b2	2.2~2.6	H	14.8~15.6	r2	12° (typ)
b3	0~0.2	h1	10.2~10.7		
d1	1.2~1.4	h2	8.9~9.4		

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW FDB8832	TO-263	800	Tape and reel