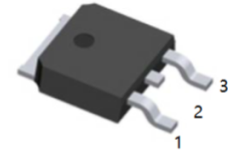


Features

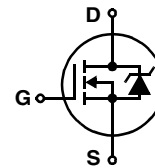
- $V_{DS}(V) = 30V$
- $I_D = 35A$ ($V_{GS} = 10V$)
- $R_{DS(ON)} < 5.7m\Omega$ ($V_{GS} = 10V$)
- $R_{DS(ON)} < 6.8m\Omega$ ($V_{GS} = 4.5V$)
- Low Miller Charge
- Low Q_{RR} Body Diode
- UIS Capability (Single Pulse and Repetitive Pulse)



1.G 2.D 3.S
TO-252(DPAK) top view

Applications

- 12V Automotive Load Control
- Starter / Alternator Systems
- Electronic Power Steering Systems
- ABS
- 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 ($T_C < 154^\circ C$, $V_{GS} = 10V$)	35	A
	Continuous ($T_C < 150^\circ C$, $V_{GS} = 4.5V$)	35	A
	Continuous ($T_{amb} = 25^\circ C$, $V_{GS} = 10V$, with $R_{\theta JA} = 52^\circ C/W$)	17	A
	Pulsed	Figure 4	A
E_{AS}	Single Pulse Avalanche Energy (Note 1)	168	mJ
P_D	Power dissipation	80	W
	Derate above $25^\circ C$	0.53	W/ $^\circ C$
T_J, T_{STG}	Operating and Storage Temperature	-55 to 175	$^\circ C$

Thermal Characteristics

$R_{\theta JC}$	Thermal Resistance Junction to Case TO-252,	1.88	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient TO-252	100	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient TO-252, 1in ² copper pad area	52	$^\circ C/W$

Electrical Characteristics $T_C = 25^\circ\text{C}$ 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	$V_{DS} = 25\text{V}$ $V_{GS} = 0\text{V}$ $T_C = 150^\circ\text{C}$			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	$V_{GS} = V_{DS}, I_D = 250\mu\text{A}$	1.2		2.5	V
$r_{DS(ON)}$	Drain to Source On Resistance	$I_D = 35\text{A}, V_{GS} = 10\text{V}$ $I_D = 35\text{A}, V_{GS} = 4.5$		4.7 5.7	5.7 6.8	$\text{m}\Omega$
C_{ISS}	Input Capacitance	$V_{DS} = 15\text{V}, V_{GS} = 0\text{V},$ $f = 1\text{MHz}$		2525		pF
C_{OSS}	Output Capacitance			490		pF
C_{RSS}	Reverse Transfer Capacitance			300		pF
R_G	Gate Resistance	$V_{GS} = 0.5\text{V}, f = 1\text{MHz}$		2.1		Ω
$Q_g(TOT)$	Total Gate Charge at 10V	$V_{GS} = 0\text{V to } 10\text{V}$	$V_{DD} = 15\text{V}$ $I_D = 35\text{A}$ $I_g = 1.0\text{mA}$	46	60	nC
$Q_g(5)$	Total Gate Charge at 5V	$V_{GS} = 0\text{V to } 5\text{V}$		24	32	nC
$Q_g(TH)$	Threshold Gate Charge	$V_{GS} = 0\text{V to } 1\text{V}$		2.3	3.0	nC
Q_{gs}	Gate to Source Gate Charge			6.9		nC
Q_{gs2}	Gate Charge Threshold to Plateau			4.6		nC
Q_{gd}	Gate to Drain "Miller" Charge			9.8		nC
t_{ON}	Turn-On Time	$V_{DD} = 15\text{V}, I_D = 35\text{A}$ $V_{GS} = 4.5\text{V}, R_{GS} = 6.2\Omega$			283	ns
$t_{d(ON)}$	Turn-On Delay Time			18		ns
t_r	Rise Time			171		ns
$t_{d(OFF)}$	Turn-Off Delay Time			31		ns
t_f	Fall Time			61		ns
t_{OFF}	Turn-Off Time				137	ns
V_{SD}	Source to Drain Diode Voltage		$I_{SD} = 35\text{A}$ $I_{SD} = 15\text{A}$			1.25 1.0
t_{rr}	Reverse Recovery Time	$I_{SD} = 35\text{A}, dI_{SD}/dt = 100\text{A}/\mu\text{s}$			27	ns
Q_{RR}	Reverse Recovered Charge	$I_{SD} = 35\text{A}, dI_{SD}/dt = 100\text{A}/\mu\text{s}$			12	nC

Notes:

1: Starting $T_J = 25^\circ\text{C}$, $L = 0.43\text{mH}$, $I_{AS} = 28\text{A}$.

Typical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

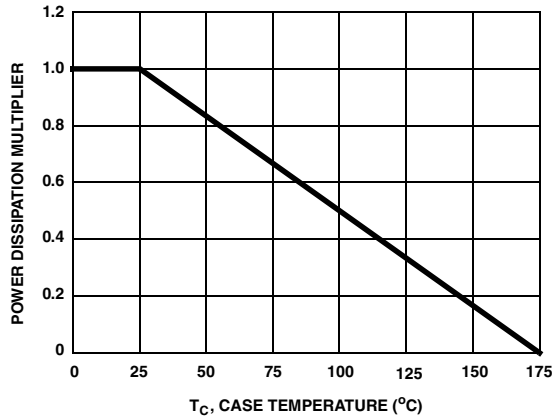


Figure 1. Normalized Power Dissipation vs Ambient Temperature

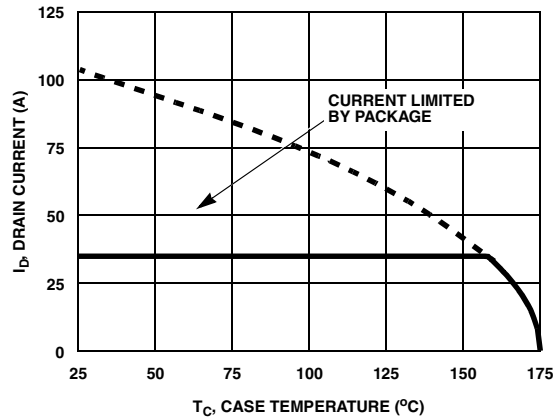


Figure 2. Maximum Continuous Drain Current vs Case Temperature

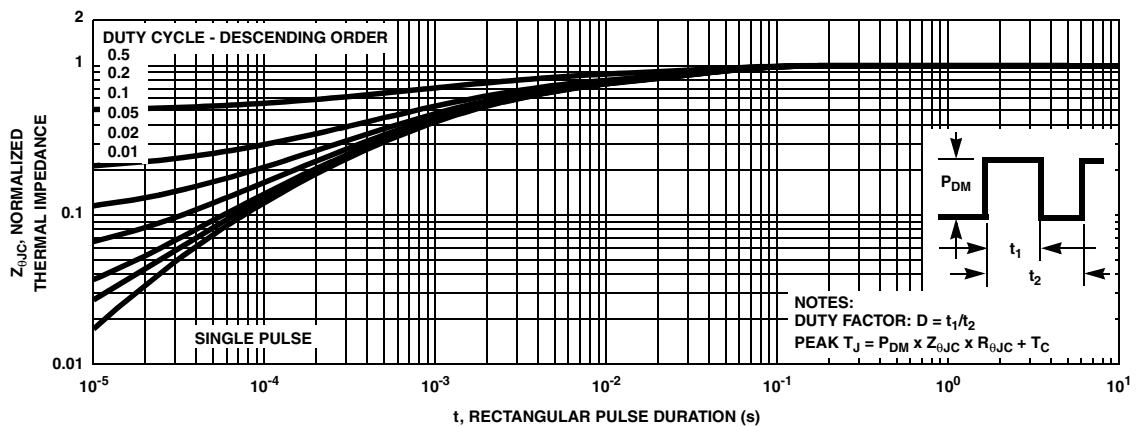


Figure 3. Normalized Maximum Transient Thermal Impedance

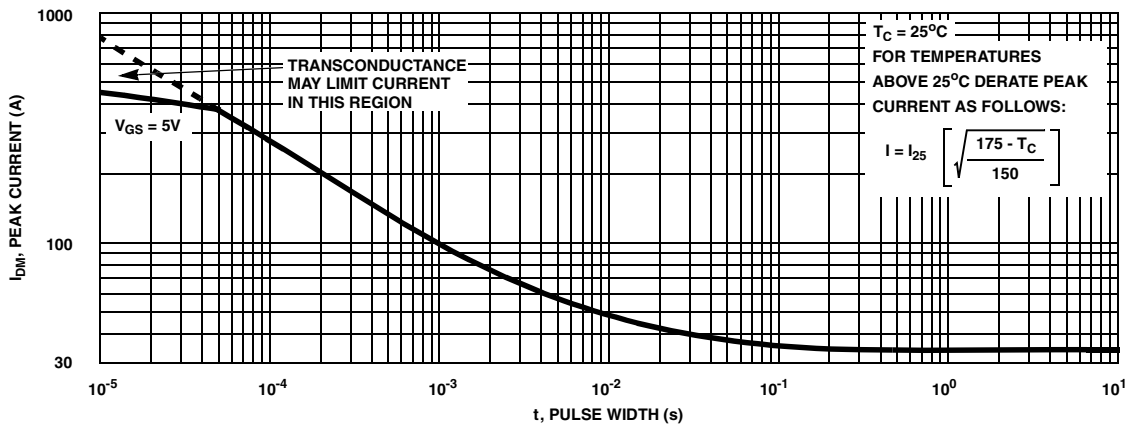


Figure 4. Peak Current Capability

Typical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

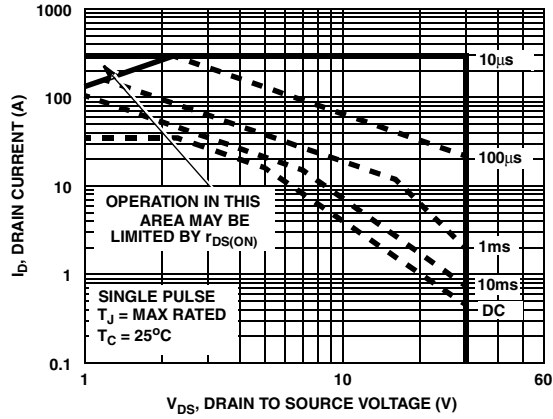
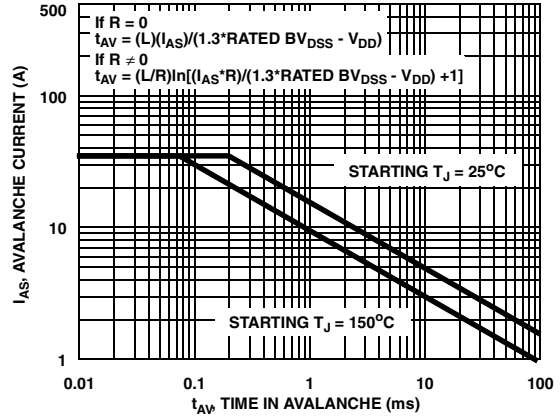


Figure 5. Forward Bias Safe Operating Area



NOTE: Refer to Fairchild Application Notes AN7514 and AN7515

Figure 6. Unclamped Inductive Switching Capability

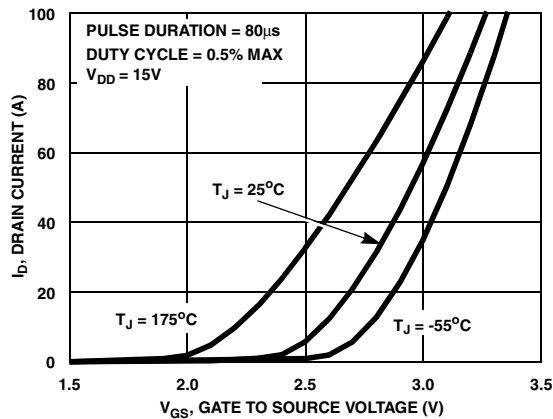


Figure 7. Transfer Characteristics

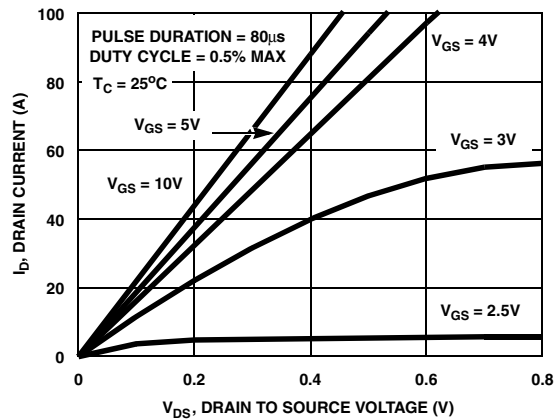


Figure 8. Saturation Characteristics

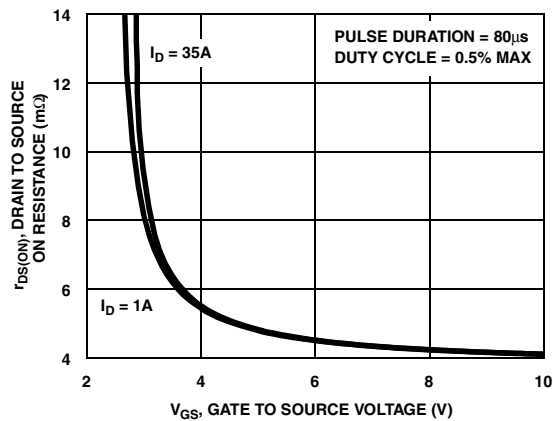


Figure 9. Drain to Source On Resistance vs Gate Voltage and Drain Current

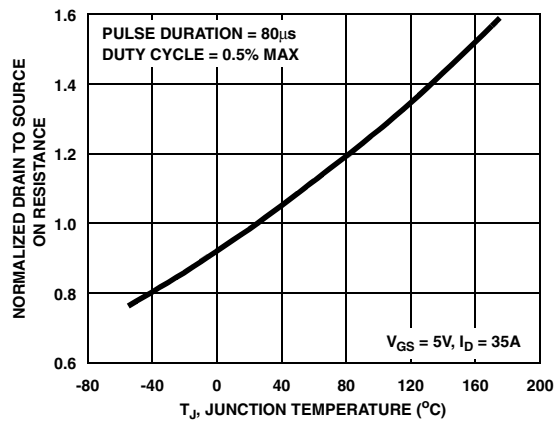


Figure 10. Normalized Drain to Source On Resistance vs Junction Temperature

Typical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

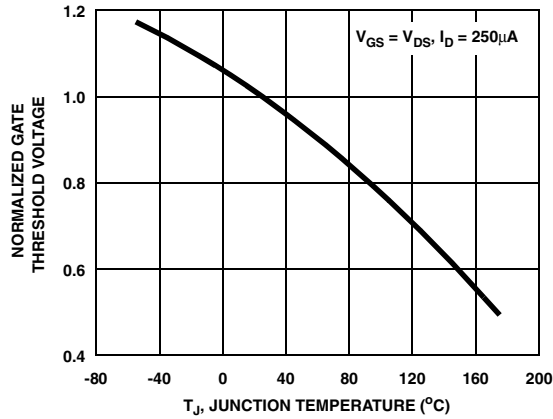


Figure 11. Normalized Gate Threshold Voltage vs Junction Temperature

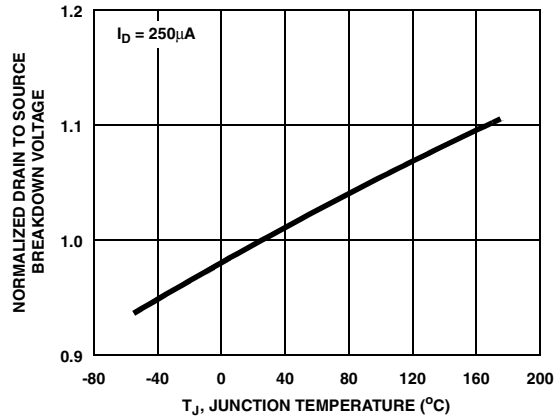


Figure 12. Normalized Drain to Source Breakdown Voltage vs Junction Temperature

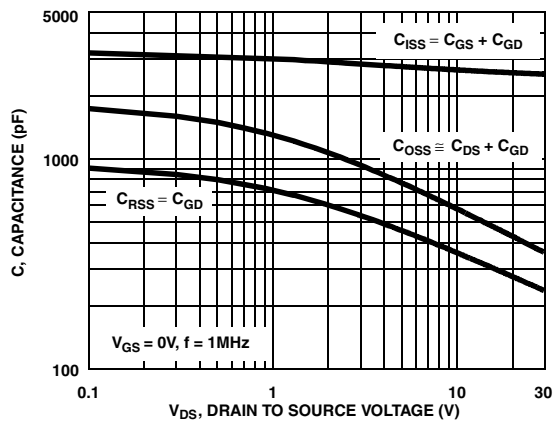


Figure 13. Capacitance vs Drain to Source Voltage

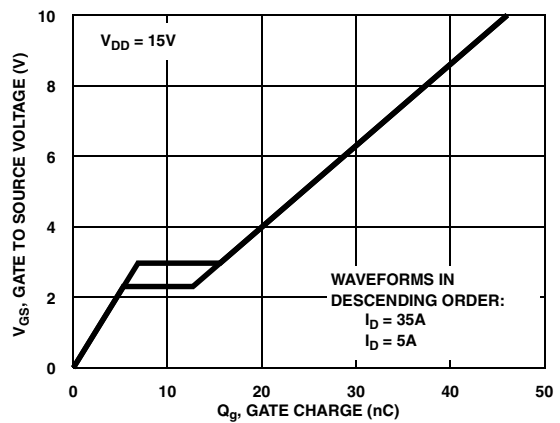
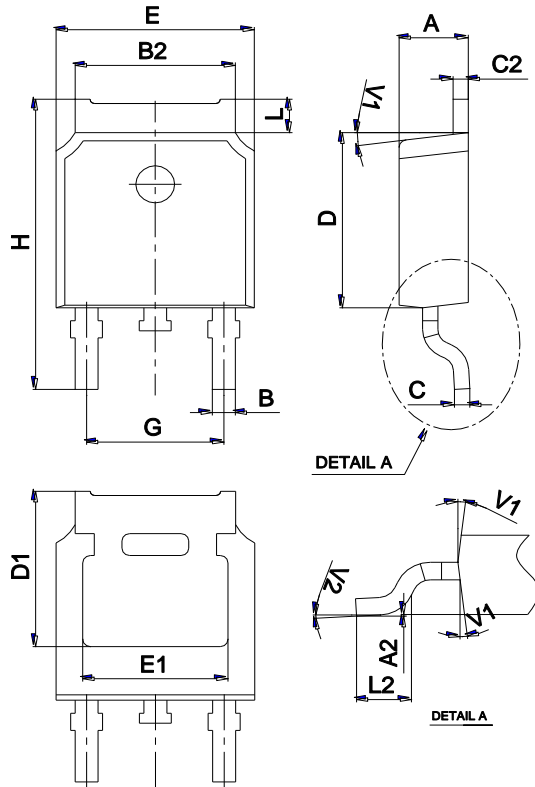
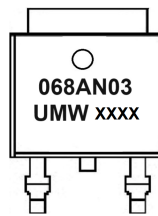


Figure 14. Gate Charge Waveforms for Constant Gate Current

Package Mechanical Data TO-252



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW FDD068AN03L	TO-252	2500	Tape and reel