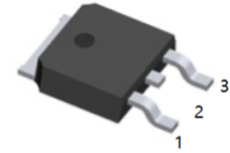


General Description

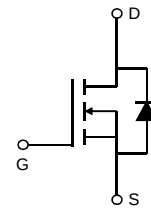
- Very Low RDS(on) at 10VGS
- Low Gate Charge
- High Current Capability



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

Application

- DC/DC Converters in Computing
- Isolated DC/DC Converters in Telecom and Industrial
- 100% UIS Tested
- 100% R_g Tested
- V_{DS}(V) = 30V
- I_D = 70A (V_{GS} = 10V)
- R_{DS(ON)} < 3mΩ (V_{GS} = 10V)
- R_{DS(ON)} < 4.5mΩ (V_{GS} = 4.5V)



Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current ^G	I _D	70	A
T _C =25°C			
T _C =100°C		55	
Pulsed Drain Current ^C	I _{DM}	159	
Continuous Drain Current	I _{DSM}	22	A
T _A =25°C			
T _A =70°C		18	
Avalanche Current ^C	I _{AS}	37	A
Avalanche energy L=0.1mH ^C	E _{AS}	68	mJ
V _{DS} Spike	V _{SPIKE}	36	V
Power Dissipation ^B	P _D	50	W
T _C =25°C			
T _C =100°C		25	
Power Dissipation ^A	P _{DSM}	2.5	W
T _A =25°C			
T _A =70°C		1.6	
Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 175	°C

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient	R _{θJA}	16	20	°C/W
t ≤ 10s				
Maximum Junction-to-Ambient	R _{θJC}	41	50	°C/W
Steady-State				
Maximum Junction-to-Case		2.1	3	°C/W
Steady-State				

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =250μA, V _{GS} =0V	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V T _J =55°C			1 5	μA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} = ±20V			100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.2	1.8	2.2	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =20A		2.4	3	mΩ
		V _{GS} =4.5V, I _D =20A		3.3	4.5	mΩ
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =20A		105		S
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.7	1	V
I _S	Maximum Body-Diode Continuous Current ^G				58	A
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, f=1MHz		2010		pF
C _{oss}	Output Capacitance			898		pF
C _{rss}	Reverse Transfer Capacitance			124		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	0.9	1.8	2.7	Ω
Q _g (10V)	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =20A		36	49	nC
Q _g (4.5V)	Total Gate Charge			17	23	nC
Q _{gs}	Gate Source Charge			6		nC
Q _{gd}	Gate Drain Charge			8		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =10V, V _{DS} =15V, R _L =0.75Ω, R _{GEN} =3Ω		7.5		ns
t _r	Turn-On Rise Time			4.0		ns
t _{D(off)}	Turn-Off DelayTime			37.0		ns
t _f	Turn-Off Fall Time			7.5		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =20A, dI/dt=500A/μs		14		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =20A, dI/dt=500A/μs		20.3		nC

A. The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25° C. The Power dissipation P_{DSM} is based on R_{θJA} and the maximum allowed junction temperature of 150° C. The value in any given application depends on the user's specific board design, and the maximum temperature of 175° C may be used if the PCB allows it.

B. The power dissipation P_D is based on T_{J(MAX)}=175° C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C. Single pulse width limited by junction temperature T_{J(MAX)}=175° C.

D. The R_{θJA} is the sum of the thermal impedance from junction to case R_{θJC} and case to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of T_{J(MAX)}=175° C. The SOA curve provides a single pulse rating.

G. The maximum current rating is package limited.

H. These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25° C.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

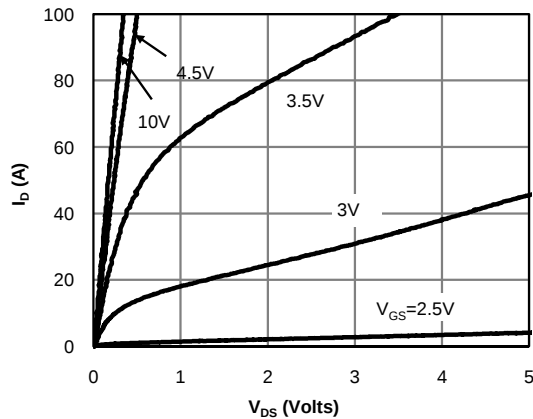


Fig 1: On-Region Characteristics (Note E)

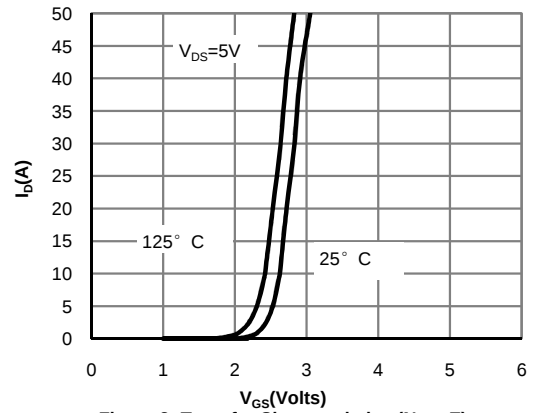


Figure 2: Transfer Characteristics (Note E)

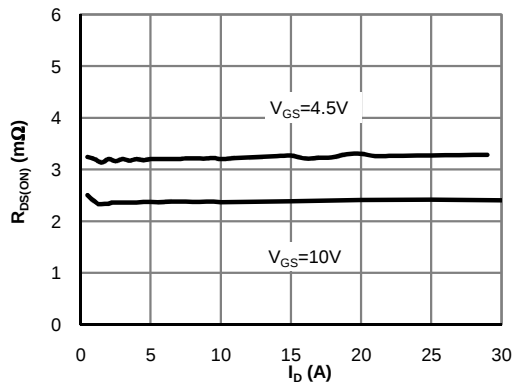


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

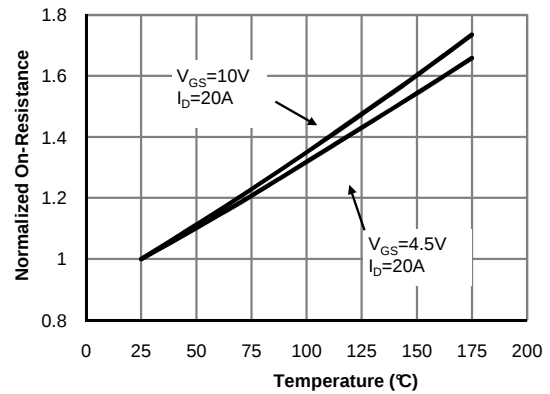


Figure 4: On-Resistance vs. Junction Temperature (Note E)

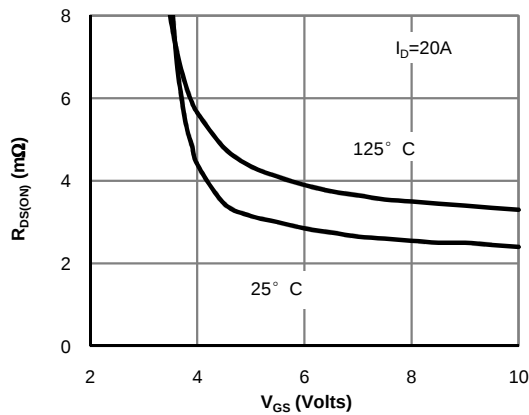


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

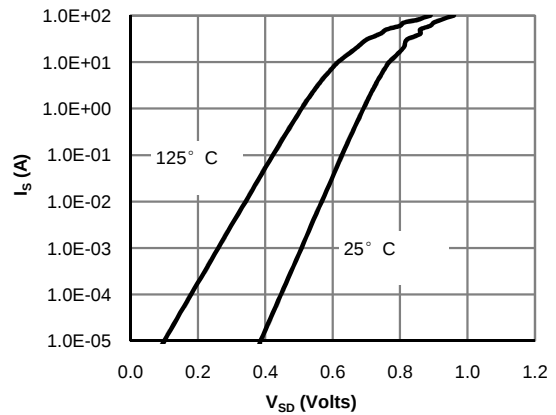
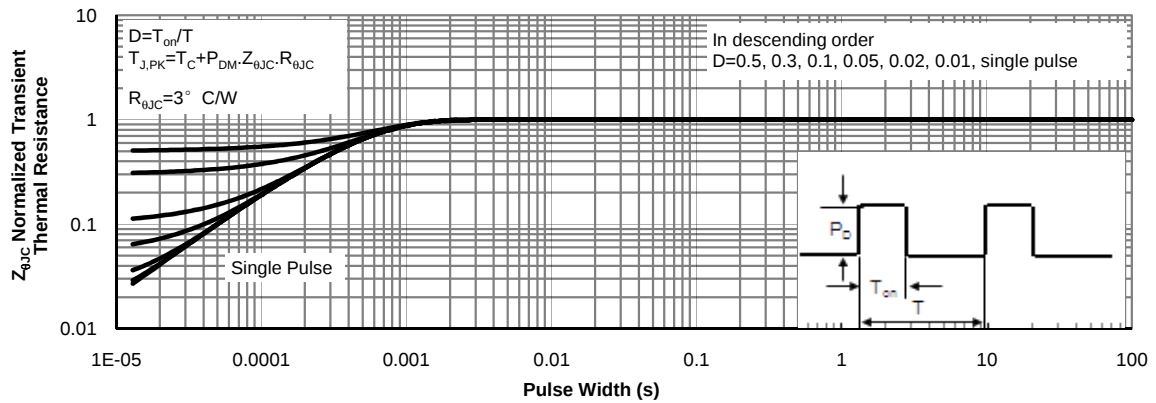
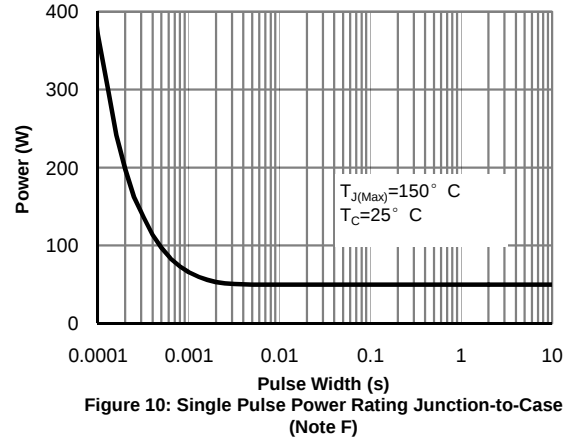
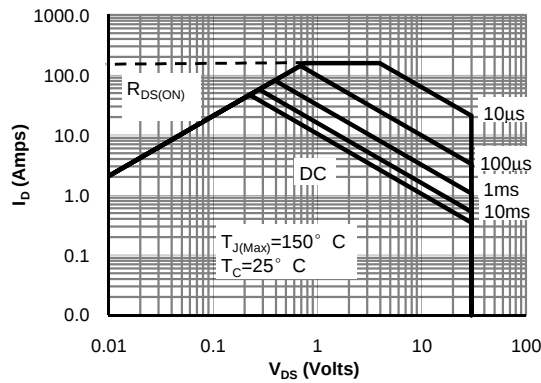
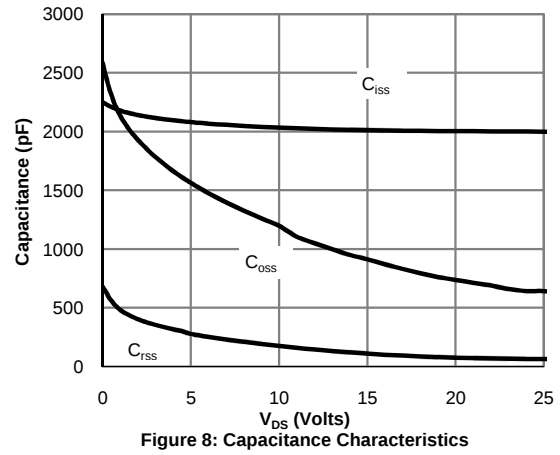
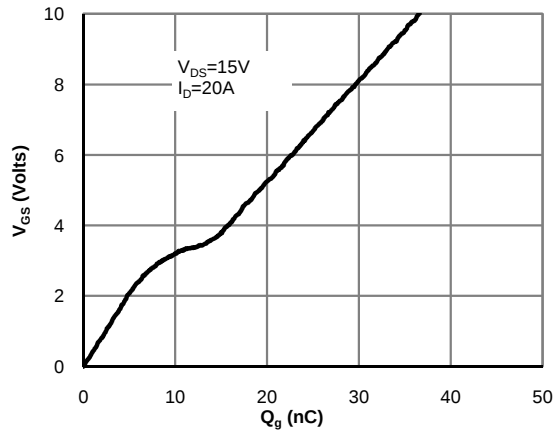


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

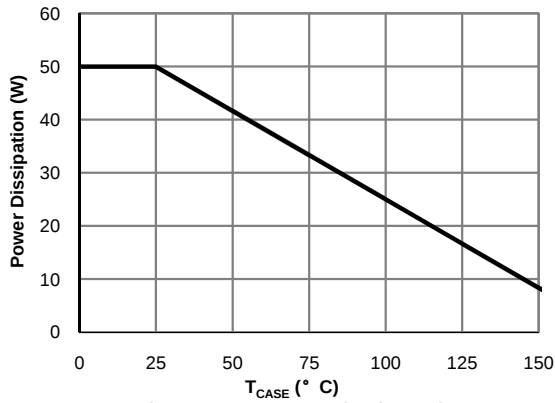


Figure 12: Power De-rating (Note F)

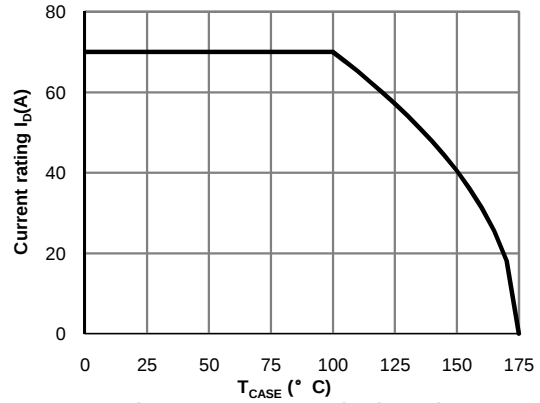


Figure 13: Current De-rating (Note F)

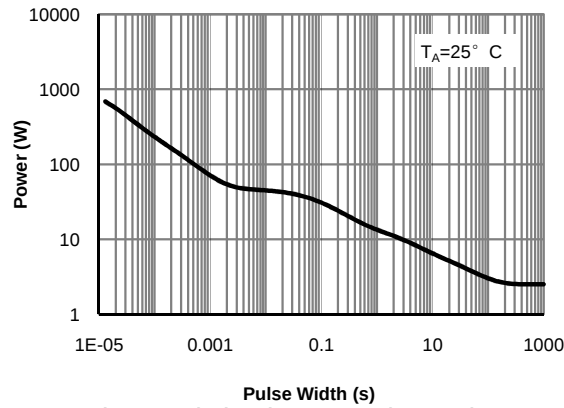


Figure 14: Single Pulse Power Rating Junction-to-Ambient (Note H)

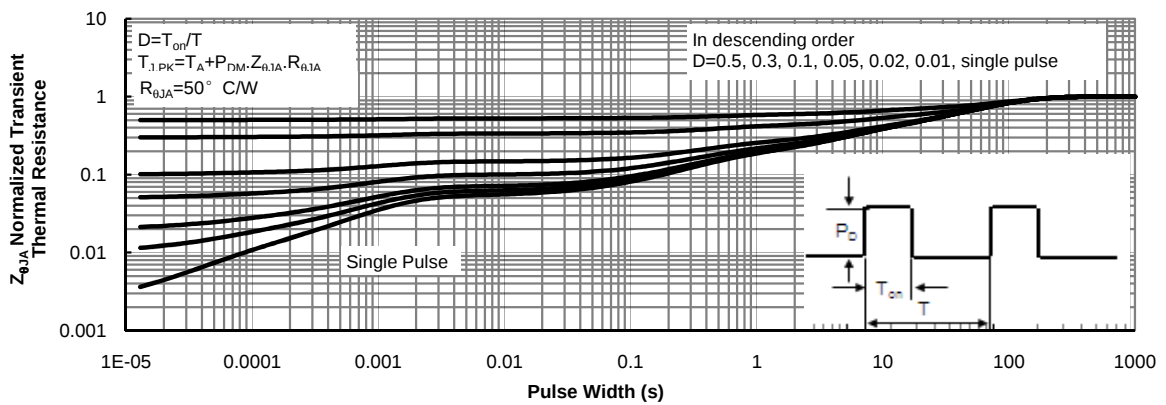
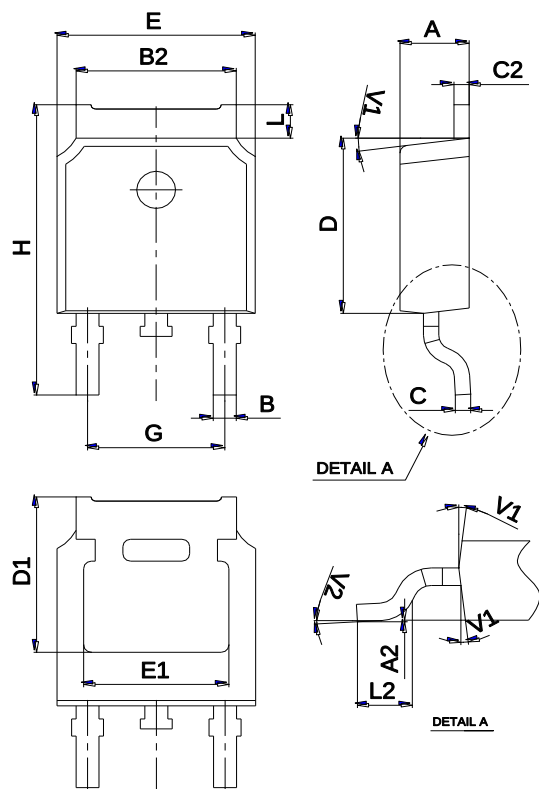


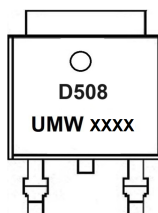
Figure 15: Normalized Maximum Transient Thermal Impedance (Note H)

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°

Marking



Ordering information

Order code	Package	Baseqty	Deliverymode
UMW AOD508	TO-252	2500	Tape and reel