

General Description

- Low $R_{DS(ON)}$
- With ESD Protection to improve battery performance and safety
- Common drain configuration for design simplicity
- RoHS and Halogen-Free Compliant

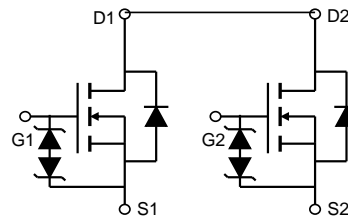
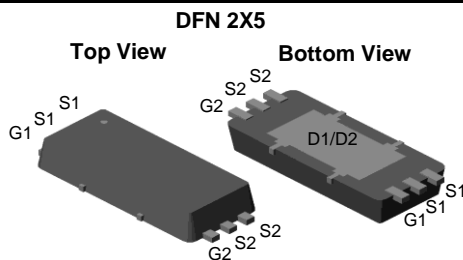
Applications

- Battery protection switch
- Mobile device battery charging and discharging

Product Summary

V_{DS}	30V
I_D (at $V_{GS}=12V$)	10A
$R_{DS(ON)}$ (at $V_{GS}=4.5V$)	< 18m Ω
$R_{DS(ON)}$ (at $V_{GS}=4V$)	< 19m Ω
$R_{DS(ON)}$ (at $V_{GS}=3.1V$)	< 21m Ω
$R_{DS(ON)}$ (at $V_{GS}=2.5V$)	< 26m Ω

Typical ESD protection **HBM Class 3A**



Orderable Part Number	Package Type	Form	Minimum Order Quantity
AON5802BG	DFN 2x5	Tape & Reel	5000

Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	$T_A=25^\circ\text{C}$	10
		$T_A=70^\circ\text{C}$	8.0
Pulsed Drain Current ^C	I_{DM}	40	A
Power Dissipation ^B	P_D	$T_A=25^\circ\text{C}$	3.1
		$T_A=70^\circ\text{C}$	2.0
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A	$R_{\theta JA}$	30	40	$^\circ\text{C}/\text{W}$
Maximum Junction-to-Ambient ^{A,D}		Steady-State	61	75
Maximum Junction-to-case	$R_{\theta JC}$	4.6	6	$^\circ\text{C}/\text{W}$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
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} =±12V			±10	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.5	1	1.5	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} =4.5V, I _D =7A T _J =125°C	11	14	18	mΩ
		V _{GS} =4V, I _D =5A	11.5	14.5	19	
		V _{GS} =3.1V, I _D =5A	12	15	21	mΩ
		V _{GS} =2.5V, I _D =5A	12.5	17.5	26	mΩ
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =7A		45		S
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.7	1	V
I _S	Maximum Body-Diode Continuous Current				4	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, f=1MHz		1050		pF
C _{oss}	Output Capacitance			90		pF
C _{rss}	Reverse Transfer Capacitance			65		pF
R _g	Gate resistance	f=1MHz		1.4		kΩ
SWITCHING PARAMETERS						
Q _g (10V)	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =7A		22.5	32	nC
Q _g (4.5V)	Total Gate Charge			10.5	15	nC
Q _{gs}	Gate Source Charge			5		nC
Q _{gd}	Gate Drain Charge			4		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =10V, V _{DS} =15V, R _L =2.15Ω, R _{GEN} =3Ω		230		ns
t _r	Turn-On Rise Time			290		ns
t _{D(off)}	Turn-Off DelayTime			3.2		μs
t _f	Turn-Off Fall Time			1.5		μs
t _{rr}	Body Diode Reverse Recovery Time	I _F =7A, di/dt=500A/μs		8		ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =7A, di/dt=500A/μs		10		nC

- A. The value of R_{nJA} 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 value in any given application depends on the user's specific board design.
- B. The power dissipation P_D is based on T_{J(MAX)}=150° C, using ≤ 10s junction-to-ambient thermal resistance.
- C. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150° C. Ratings are based on low frequency and duty cycles to keep initial T_J=25° C.
- D. The R_{nJA} is the sum of the thermal impedance from junction to lead R_{nJL} and lead 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-ambient thermal impedance which is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, assuming a maximum junction temperature of T_{J(MAX)}=150° C. The SOA curve provides a single pulse rating.

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

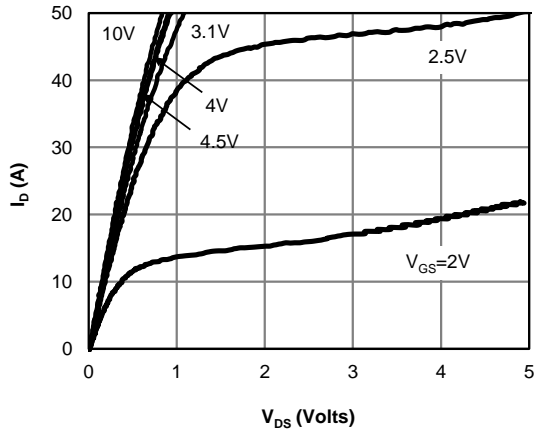


Figure 1: On-Region Characteristics (Note E)

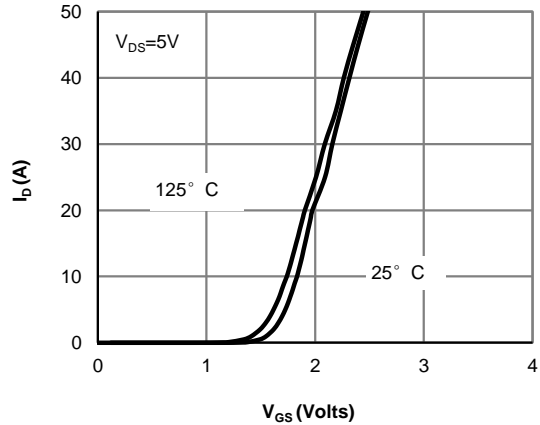


Figure 2: Transfer Characteristics (Note E)

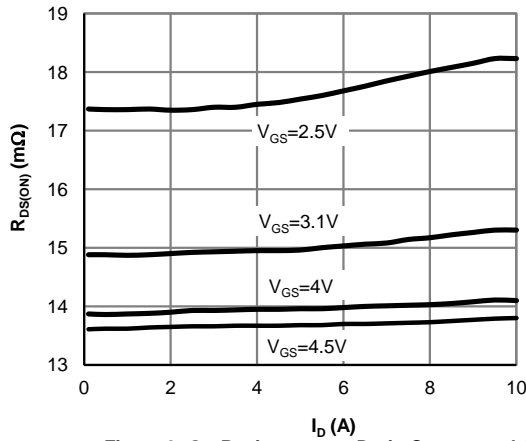


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

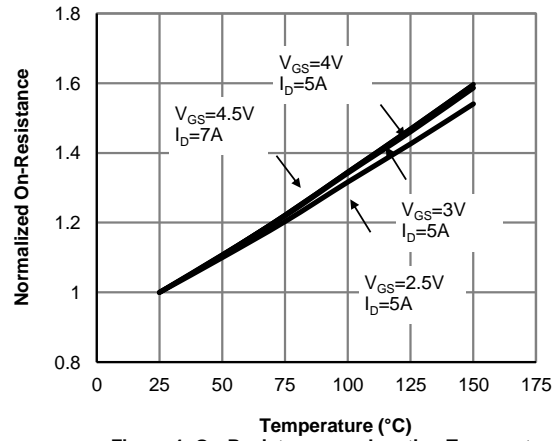


Figure 4: On-Resistance vs. Junction Temperature (Note E)

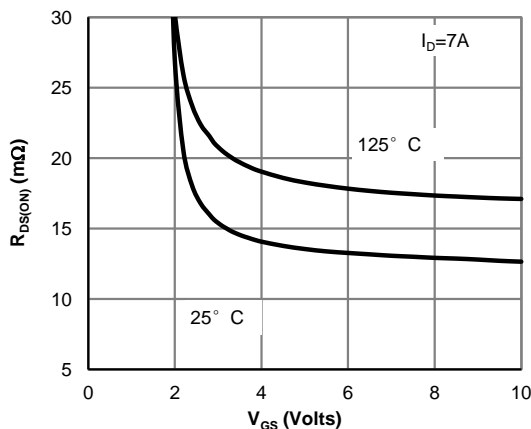


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

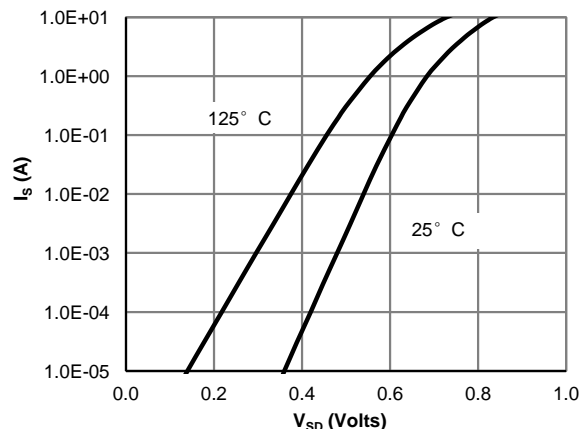


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

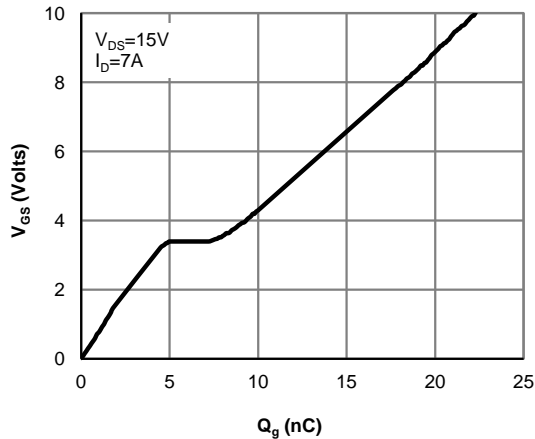


Figure 7: Gate-Charge Characteristics

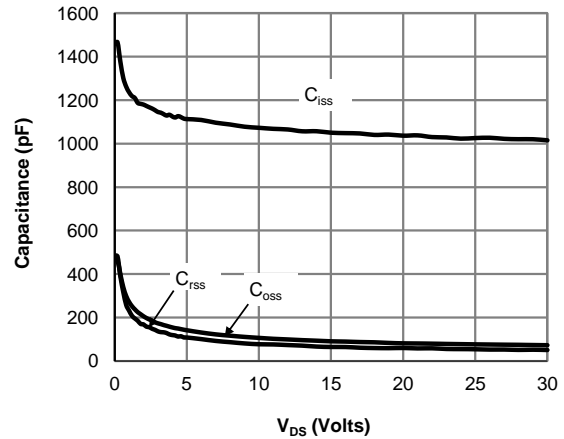


Figure 8: Capacitance Characteristics

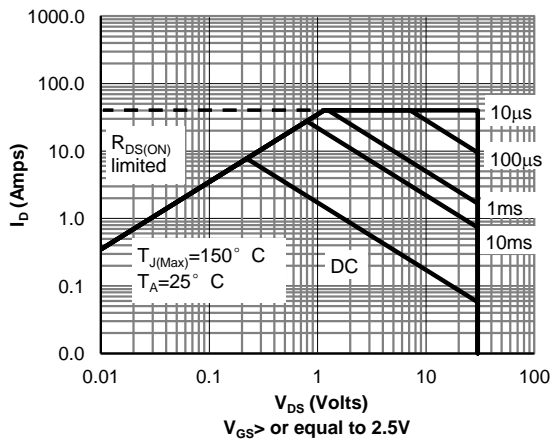


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

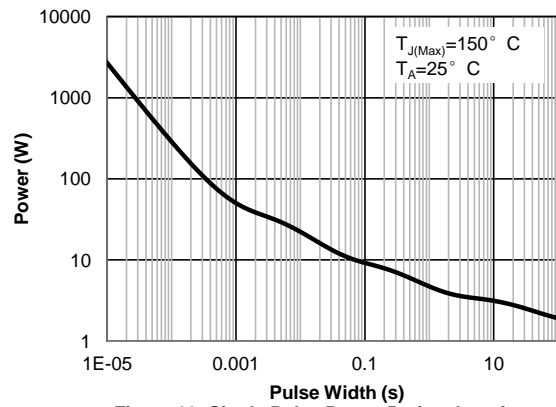


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

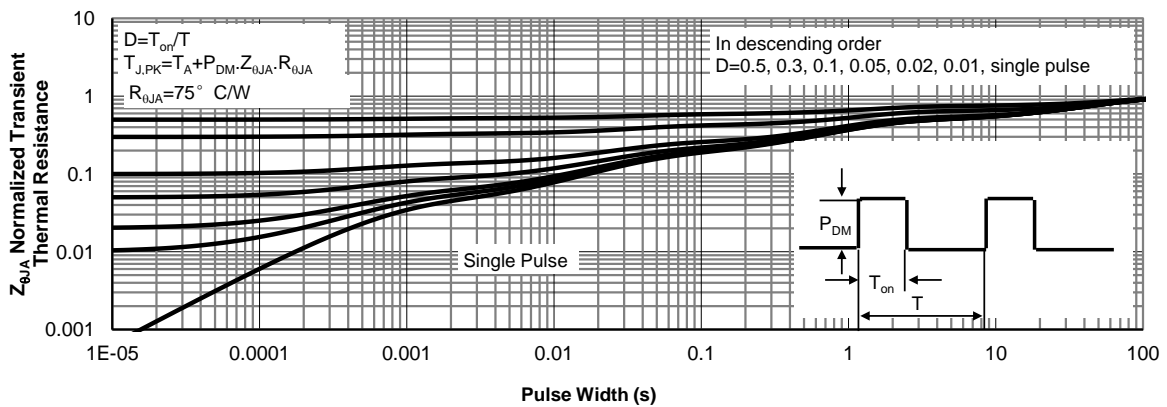


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

Figure A: Gate Charge Test Circuit & Waveforms

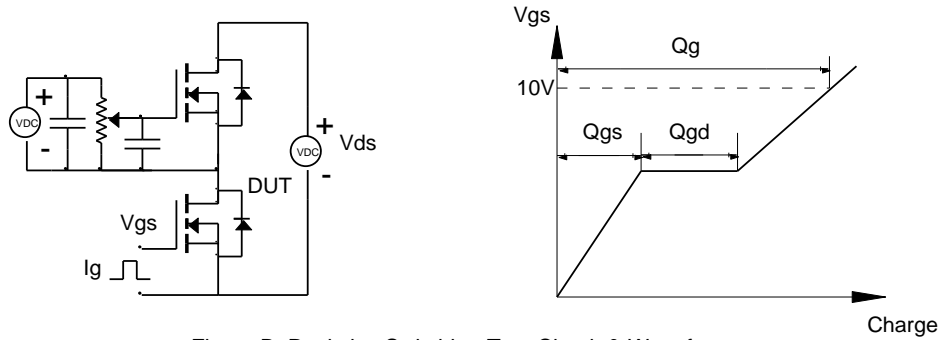


Figure B: Resistive Switching Test Circuit & Waveforms

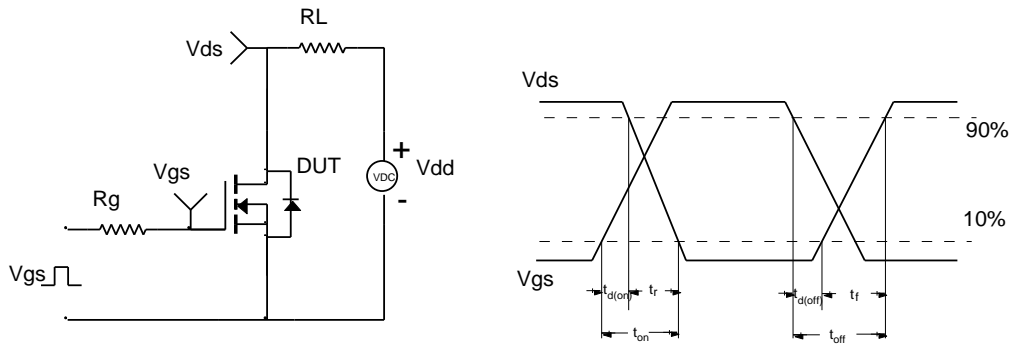


Figure C: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

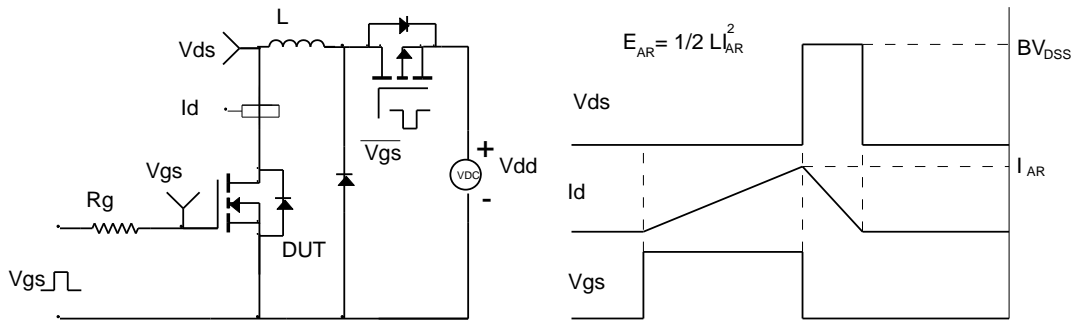
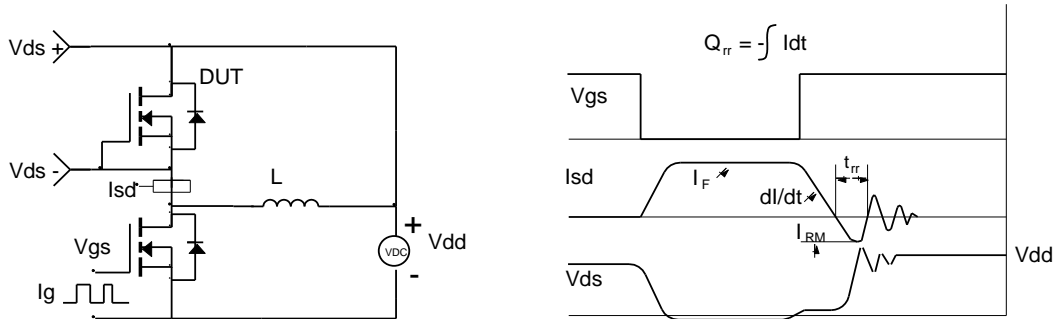


Figure D: Diode Recovery Test Circuit & Waveforms



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[DMN1006UCA6-7](#) [DMN16M9UCA6-7](#)