



ALPHA & OMEGA
SEMICONDUCTOR

AOC2802

Common-Drain Dual N-Channel Enhancement Mode Field Effect Transistor

General Description

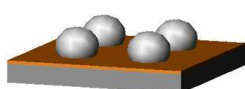
The AOC2802 uses advanced trench technology to provide excellent $R_{SS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V while retaining a 12V $V_{GS(MAX)}$ rating. It is ESD protected. This device is suitable for use as a uni-directional or bi-directional load switch, facilitated by its common-drain configuration.

Product Summary

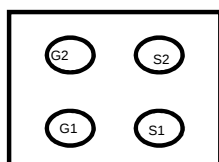
V_{SS}	20V
I_D (at $V_{GS}=4.5V$)	6A
$R_{SS(ON)}$ (at $V_{GS}=4.5V$)	< 34m Ω
$R_{SS(ON)}$ (at $V_{GS}=4.0V$)	< 35m Ω
$R_{SS(ON)}$ (at $V_{GS}=3.1V$)	< 43m Ω
$R_{SS(ON)}$ (at $V_{GS}=2.5V$)	< 54m Ω



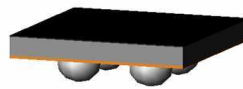
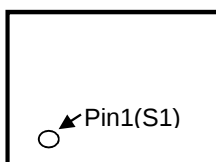
WLCSP 1.57x1.57_4



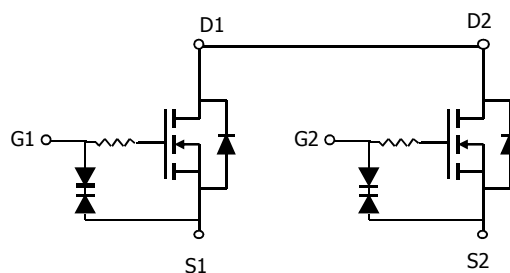
Bottom View



Top View



Equivalent Circuit



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

Parameter	Symbol	Maximum	Units
Source-Source Voltage	V_{SS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Source Current (DC) ^{Note1}	I_S	6	A
Source Current (Pulse) ^{Note2}	I_{SM}	60	
Power Dissipation ^{Note1}	P_D	1.3	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

Note 1. Mounted on minimum pad PCB

Note 2. PW < 300 μs pulses, duty cycle 0.5% max

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV _{SSS}	Source-Source Breakdown Voltage	I _S =250μA, V _{GS} =0V, Test Circuit 6	20			V
I _{SSS}	Zero Gate Voltage Source Current	V _{SS} =20V, V _{GS} =0V, Test Circuit 1			1	μA
		T _J =55°C			5	
I _{GSS}	Gate leakage current	V _{SS} =0V, V _{GS} = ±10V, Test Circuit 2		1	10	
BV _{GSO}	Gate-Source Breakdown Voltage	V _{SS} =0V, I _G =±250μA, Test Circuit 7	±12			V
V _{GS(th)}	Gate Threshold Voltage	V _{SS} =V _{GS} I _S =250μA, Test Circuit 3	0.5	1	1.5	V
R _{SS(ON)}	Static Source to Source On-Resistance Note	V _{GS} =4.5V, I _S =3A, Test Circuit 4		28	34	mΩ
		T _J =125°C		41	48	
		V _{GS} =4.0V, I _S =3A, Test Circuit 4		30	35	
		V _{GS} =3.1V, I _S =3A, Test Circuit 4		36	43	
		V _{GS} =2.5V, I _S =3A, Test Circuit 4		45	54	
g _{FS}	Forward Transconductance Note	V _{SS} =5V, I _S =3A, Test Circuit 3		19		S
V _{FSS}	Diode Forward Voltage Note	I _S =1A, V _{GS} =0V, Test Circuit 5		0.6	1	V
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{SS} =10V, f=1MHz,		1000	1200	pF
C _{oss}	Output Capacitance			152		pF
C _{rss}	Reverse Transfer Capacitance			114		pF
R _g	Gate resistance	V _{GS} =0V, V _{SS} =0V, f=1MHz		1.5		kΩ
SWITCHING PARAMETERS						
t _{D(on)}	Turn-On DelayTime	V _{GS} =10V, V _{SS} =10V, R _L =1.5Ω, R _{GEN} =6Ω ,		284		ns
t _r	Turn-On Rise Time			900		ns
t _{D(off)}	Turn-Off DelayTime			5		μs
t _f	Turn-Off Fall Time			4.8		μs
Q _g	Total Gate Charge	V _{G1S1} =4.5V, V _{SS} =10V, I _S =6A		10.4		nC

Note: Pulsed

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

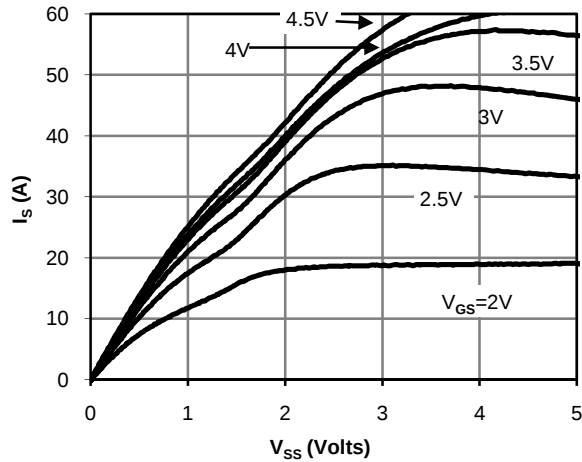


Fig 1: On-Region Characteristics

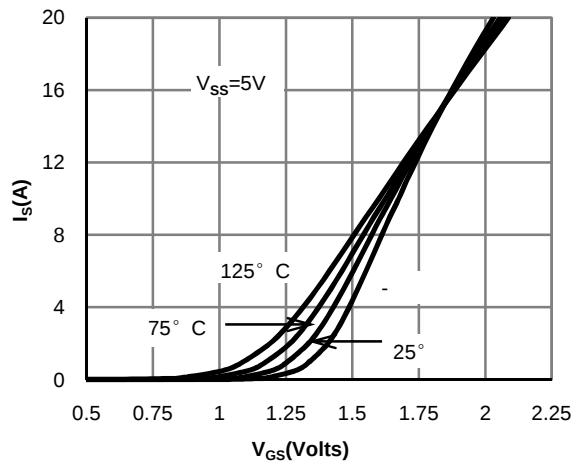


Figure 2: Transfer Characteristics

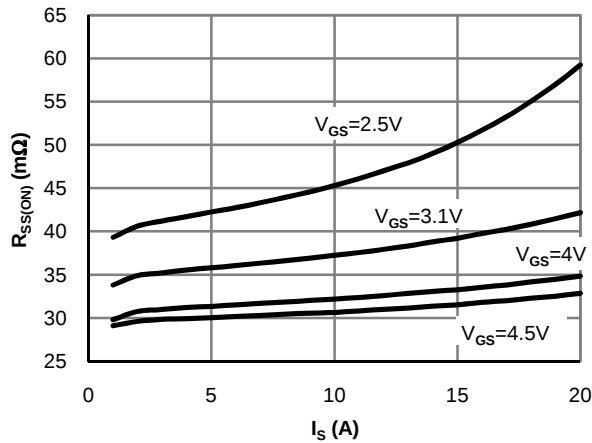


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

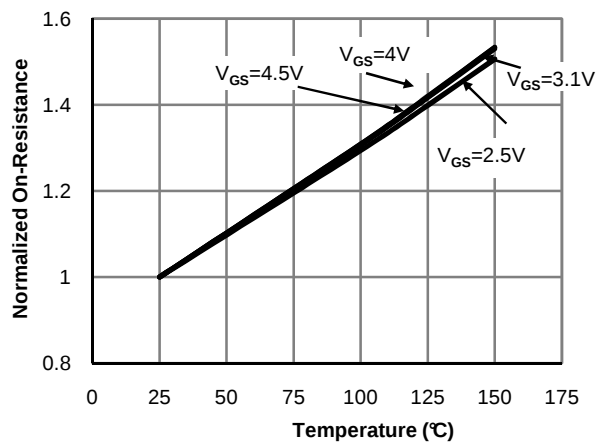


Figure 4: On-Resistance vs. Junction Temperature

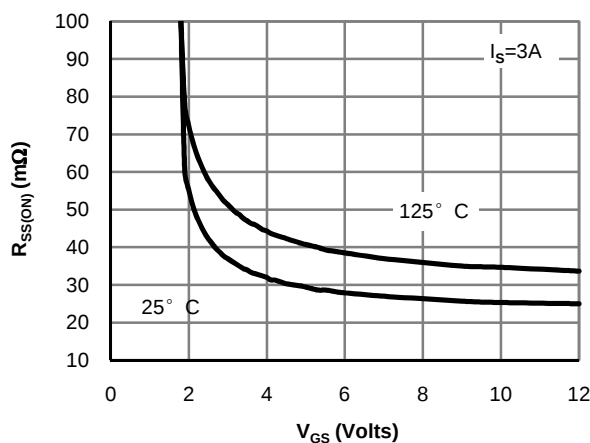


Figure 5: On-Resistance vs. Gate-Source Voltage

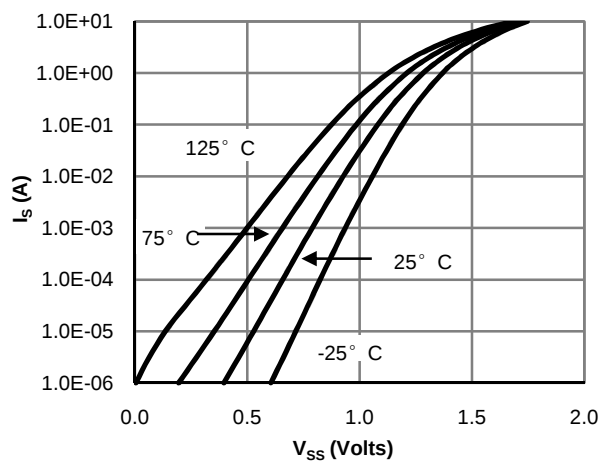
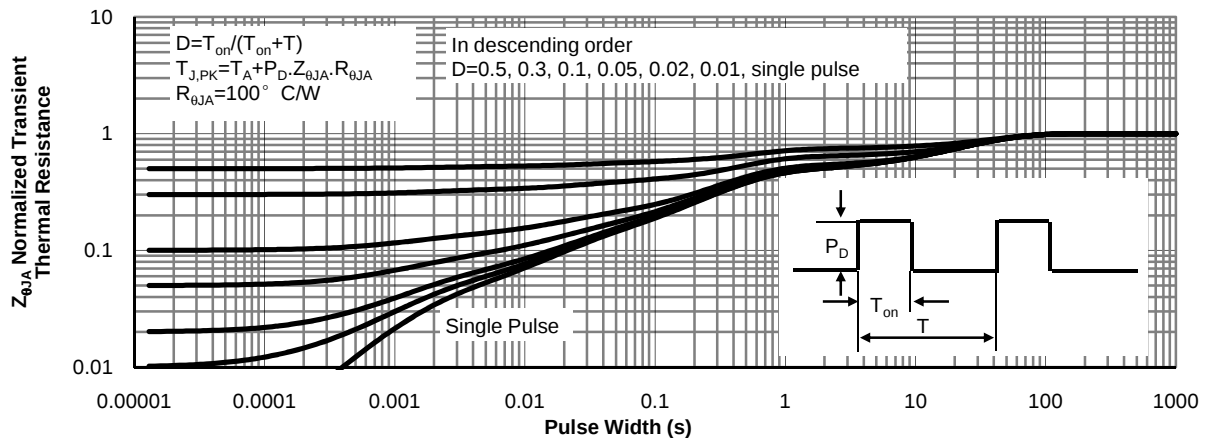
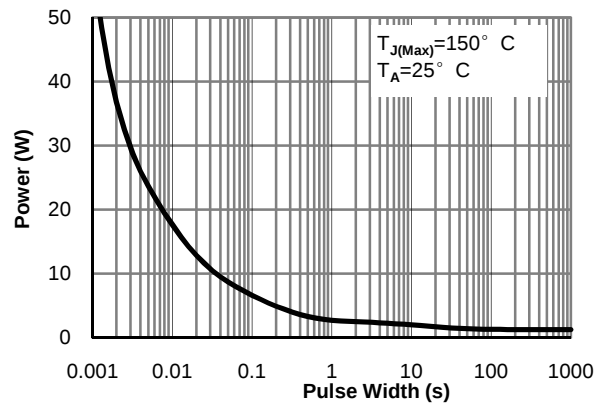
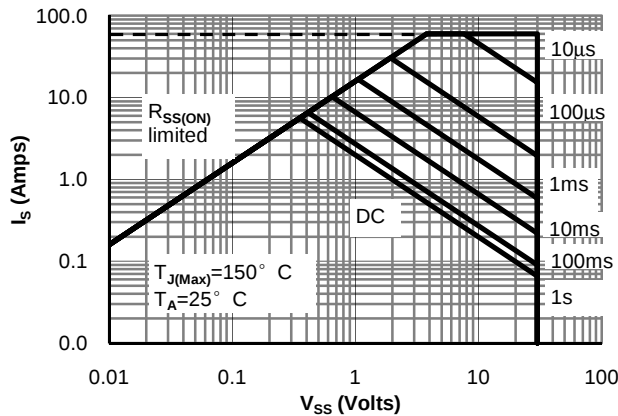
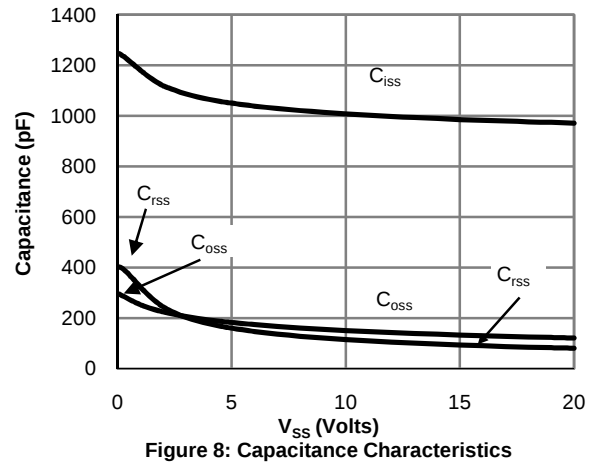
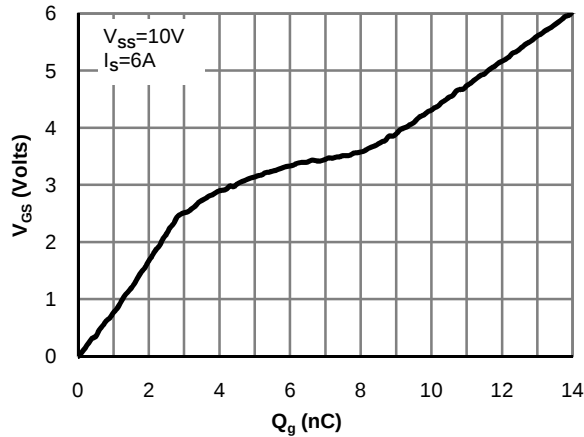


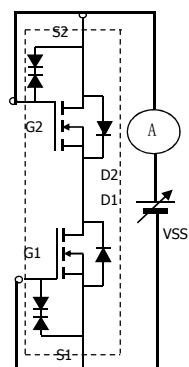
Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



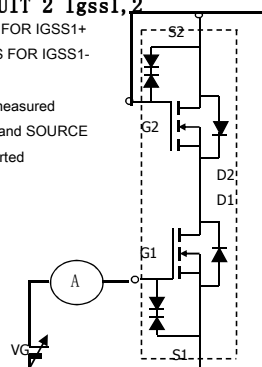
TEST CIRCUIT 1 I_{SSS}

POSITIVE VSS FOR ISSS+
NEGATIVE VSS FOR ISSS-

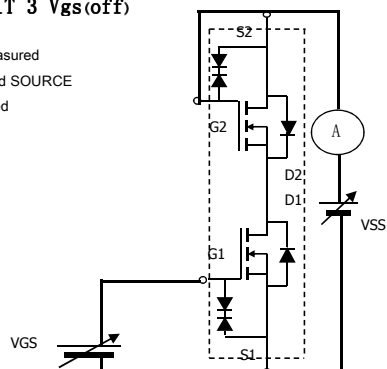
**TEST CIRCUIT 2 $I_{gss1,2}$**

POSITIVE VGS FOR IGSS1+
NEGATIVE VGS FOR IGSS1-

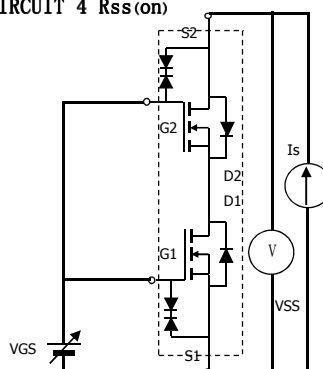
When FET1 is measured
between GATE and SOURCE
of FET2 are shorted

**TEST CIRCUIT 3 $V_{GS(off)}$**

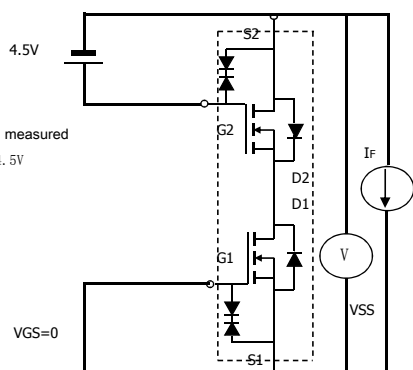
When FET1 is measured
between GATE and SOURCE
of FET2 are shorted

**TEST CIRCUIT 4 $R_{SS(on)}$**

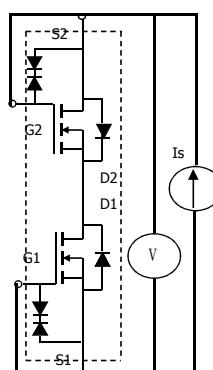
Vss/Is

**TEST CIRCUIT 5 $V_{F(SS)1,2}$**

When FET1 measured
FET2 $V_{GS}=4.5V$

**TEST CIRCUIT 6 BV_{DSS}**

POSITIVE VSS FOR ISSS+
NEGATIVE VSS FOR ISSS-

**TEST CIRCUIT 7 $BV_{GS01,2}$**

POSITIVE VSS FOR ISSS+
NEGATIVE VSS FOR ISSS-

When FET1 is measured
between GATE and SOURCE
of FET2 are shorted

