

AON6710
N-Channel Enhancement Mode Field Effect Transistor
SRFET™

General Description

SRFET™ The AON6710/L uses advanced trench technology with a monolithically integrated Schottky diode to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for use as a low side FET in SMPS, load switching and general purpose applications. AON6710 and AON6710L are electrically identical.

-RoHS Compliant

-AON6710L is Halogen Free

Features

V_{DS} (V) = 30V

I_D = 20A (V_{GS} = 10V)

$R_{DS(ON)} < 4.7m\Omega$ (V_{GS} = 10V)

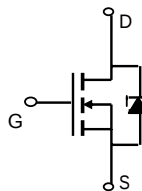
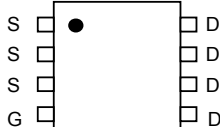
$R_{DS(ON)} < 6.7m\Omega$ (V_{GS} = 4.5V)

Fits SOIC8 footprint !



DFN5X6

Top View



SRFET™

Soft Recovery MOSFET:
Integrated Schottky Diode

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}	± 20	V
Continuous Drain Current ^{BJ}	I_D	30	A
$T_C=25^\circ\text{C}$		30	
$T_C=100^\circ\text{C}$			
Pulsed Drain Current	I_{DM}	100	
Continuous Drain Current ^H	I_{DSM}	19	A
$T_A=25^\circ\text{C}$		15	
$T_A=70^\circ\text{C}$			
Avalanche Current ^C	I_{AR}	30	A
Repetitive avalanche energy $L=0.3mH$ ^C	E_{AR}	135	mJ
Power Dissipation ^B	P_D	62	W
$T_C=25^\circ\text{C}$		25	
$T_C=100^\circ\text{C}$			
Power Dissipation ^A	P_{DSM}	2.5	W
$T_A=25^\circ\text{C}$		1.6	
$T_A=70^\circ\text{C}$			
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	$R_{\theta JA}$	14.2	20	$^\circ\text{C/W}$
$t \leq 10s$				
Maximum Junction-to-Ambient ^A	$R_{\theta JA}$	42	50	$^\circ\text{C/W}$
Steady-State				
Maximum Junction-to-Case ^C	$R_{\theta JC}$	1.2	2.0	$^\circ\text{C/W}$
Steady-State				

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 =1mA, V _{GS} =0V	30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V T _J =125°C			0.1 20	mA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} = ±20V			0.1	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} I _D =250μA	1.3	1.5	2.4	V
I _{D(ON)}	On state drain current	V _{GS} =10V, V _{DS} =5V	100			A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =20A T _J =125°C		3.7 5.3	4.7 6.7	mΩ
		V _{GS} =4.5V, I _D =20A		5.3	6.7	mΩ
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =20A		90		S
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.36	0.5	V
I _S	Maximum Body-Diode Continuous Current				5	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, f=1MHz		3760	4512	pF
C _{oss}	Output Capacitance			682		pF
C _{rss}	Reverse Transfer Capacitance			314		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz		0.75	1.5	Ω
SWITCHING PARAMETERS						
Q _g (10V)	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =20A		62	72	nC
Q _g (4.5V)	Total Gate Charge			29		nC
Q _{gs}	Gate Source Charge			12		nC
Q _{gd}	Gate Drain Charge			12		nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =10V, V _{DS} =15V, R _L =0.75Ω, R _{GEN} =3Ω		9.5	12	ns
t _r	Turn-On Rise Time			8.5		ns
t _{D(off)}	Turn-Off DelayTime			34		ns
t _f	Turn-Off Fall Time			9		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =20A, dI/dt=300A/μs		18	27	ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =20A, dI/dt=300A/μs		22		nC

A: The value of R_{θJA} is measured with the device in a still air environment with T_A=25°C.

B: The power dissipation P_D is based on T_{J(MAX)}=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsink is used.

C: Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°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 <300 μs 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)}=150°C.

G: These tests are performed with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.

H: Surface mounted on a 1 in 2 FR-4 board with 2oz. Copper.

J: Maximum current is limited by bonding wire.

Prelim: Jan 2008

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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

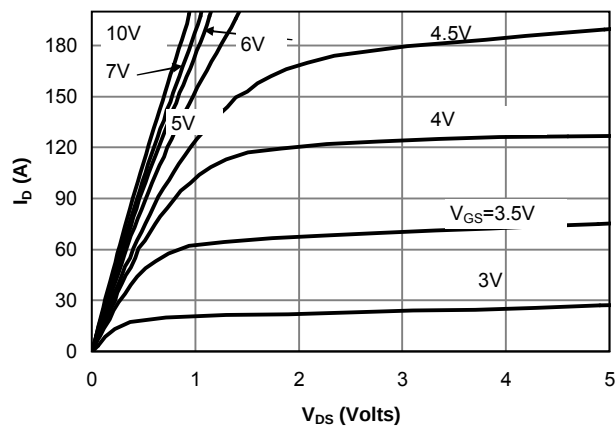


Figure 1: On-Region Characteristics

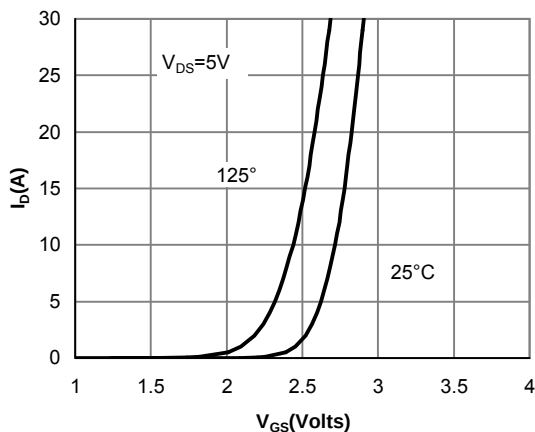


Figure 2: Transfer Characteristics

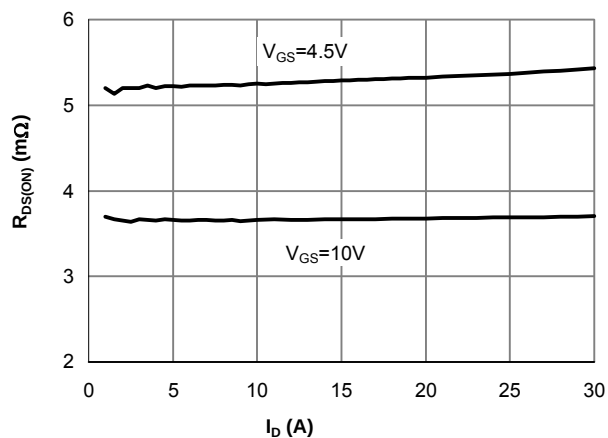


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

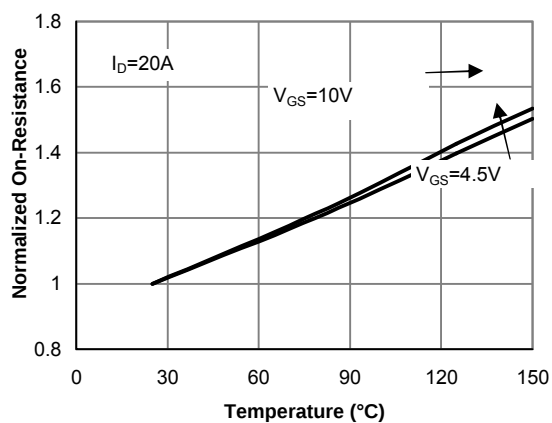


Figure 4: On-Resistance vs. Junction Temperature

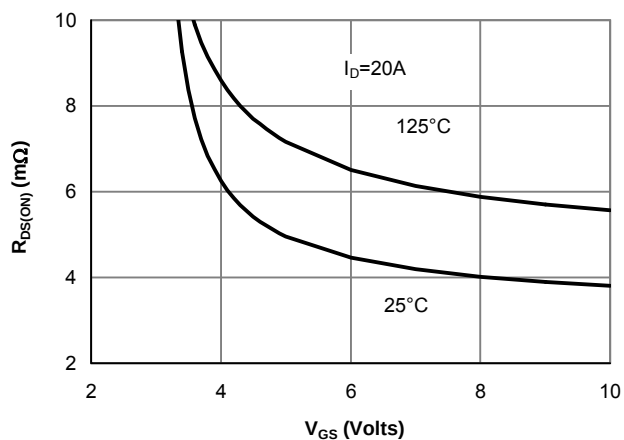


Figure 5: On-Resistance vs. Gate-Source Voltage

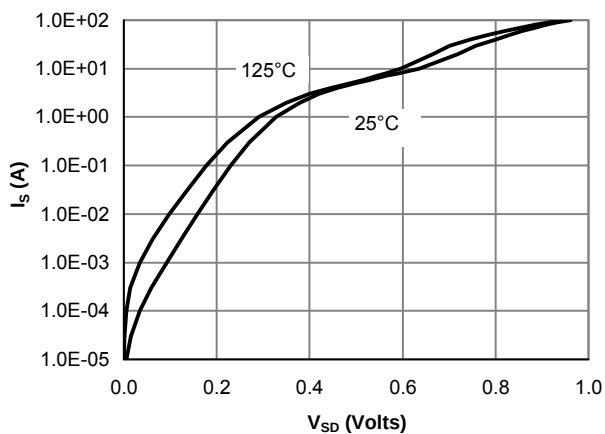


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

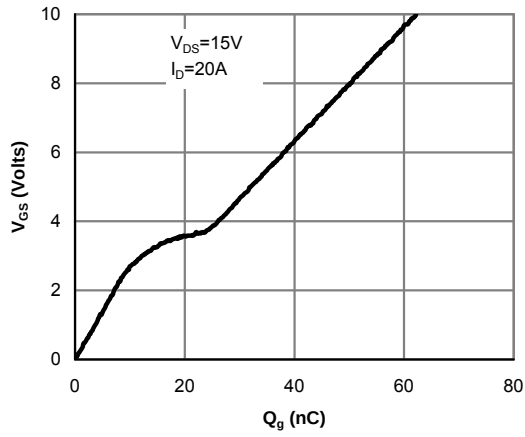


Figure 7: Gate-Charge Characteristics

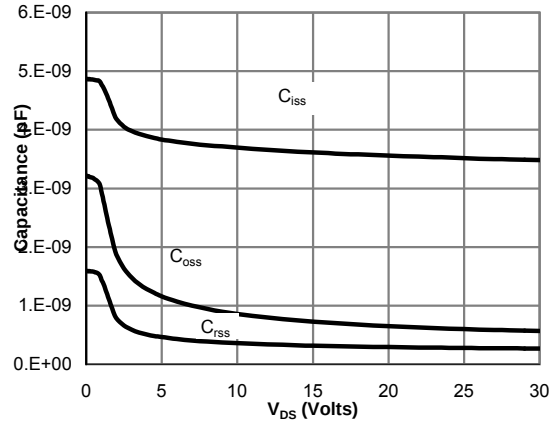


Figure 8: Capacitance Characteristics

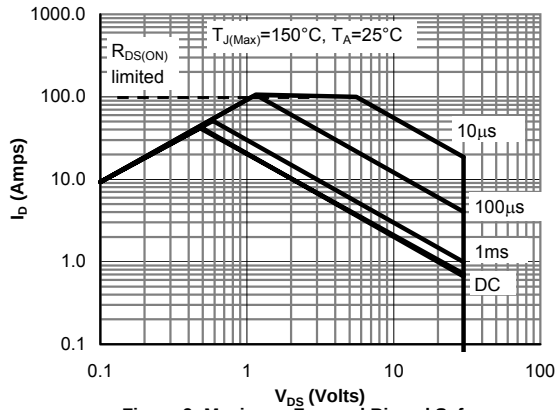


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

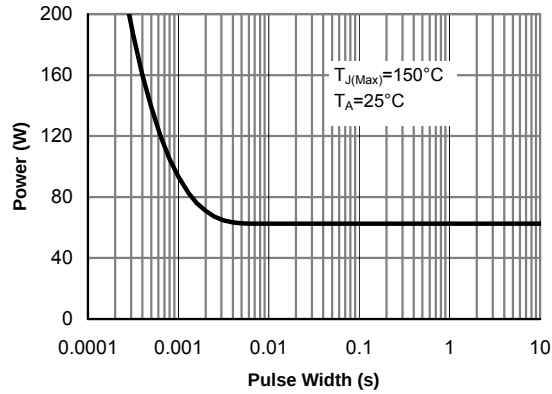


Figure 10: Single Pulse Power Rating Junction-to-Case (Note F)

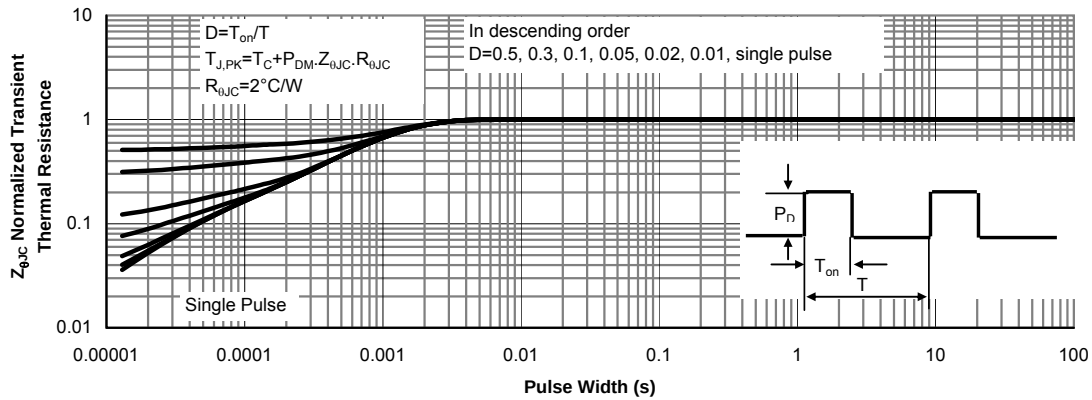


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

