



ALPHA & OMEGA
SEMICONDUCTOR

AOTF18N65

650V, 18A N-Channel MOSFET

General Description

The AOTF18N65 is fabricated using an advanced high voltage MOSFET process that is designed to deliver high levels of performance and robustness in popular AC-DC applications. By providing low $R_{DS(on)}$, C_{iss} and C_{rss} along with guaranteed avalanche capability this part can be adopted quickly into new and existing offline power supply designs.

For Halogen Free add "L" suffix to part number:
AOTF18N65L

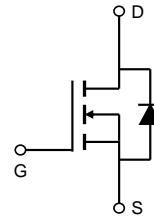
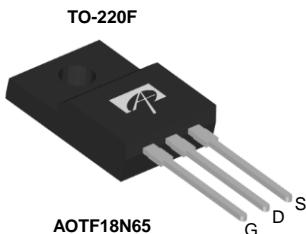
Product Summary

V_{DS}	750V@150°C
I_D (at $V_{GS}=10V$)	18A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	< 0.39Ω

100% UIS Tested
100% R_g Tested



Top View



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

Parameter	Symbol	AOTF18N65	Units
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current	I_D	18*	A
$T_C=100^\circ C$		12*	
Pulsed Drain Current ^C	I_{DM}	80	
Avalanche Current ^C	I_{AR}	6.3	A
Repetitive avalanche energy ^C	E_{AR}	595	mJ
Single pulsed avalanche energy ^G	E_{AS}	1190	mJ
Peak diode recovery dv/dt	dv/dt	5	V/ns
$T_C=25^\circ C$	P_D	50	W
Power Dissipation ^B Derate above 25°C		0.4	W/°C
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C
Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds	T_L	300	°C

Thermal Characteristics

Parameter	Symbol	AOTF18N65	Units
Maximum Junction-to-Ambient ^{A,D}	$R_{\theta JA}$	65	°C/W
Maximum Junction-to-Case	$R_{\theta JC}$	2.5	°C/W

* Drain current limited by maximum junction temperature.

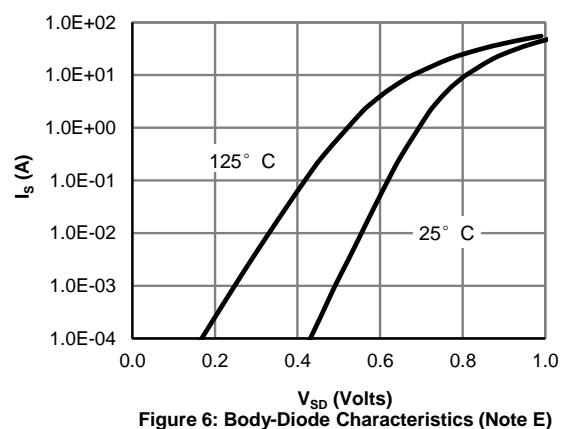
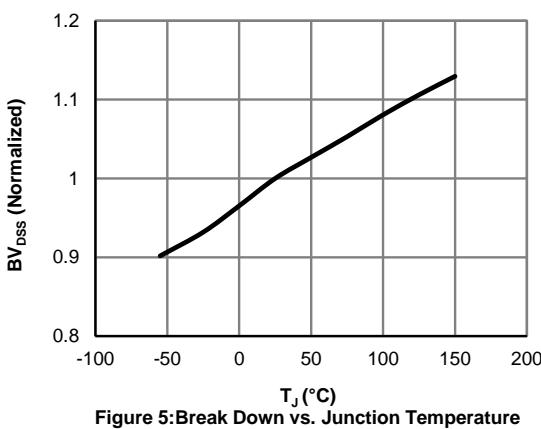
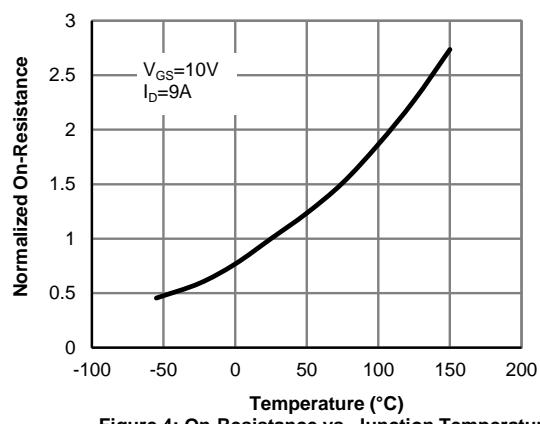
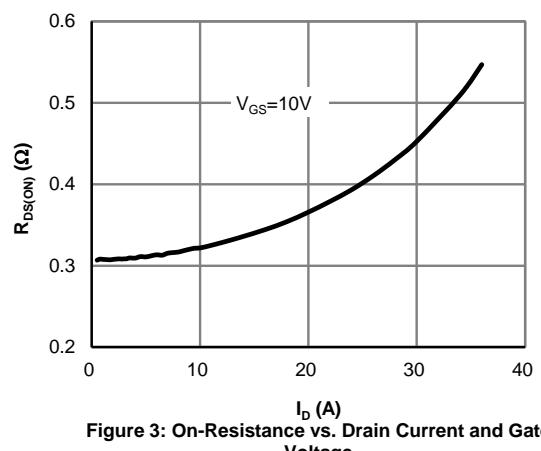
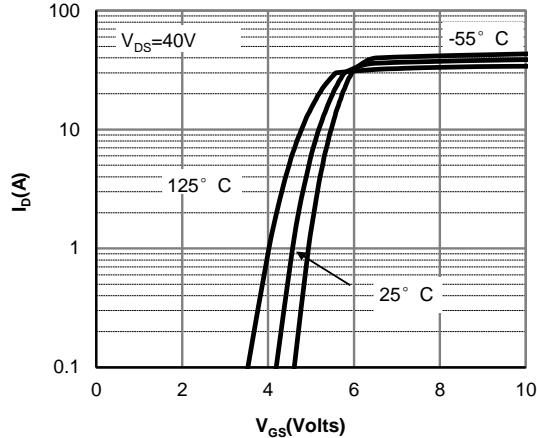
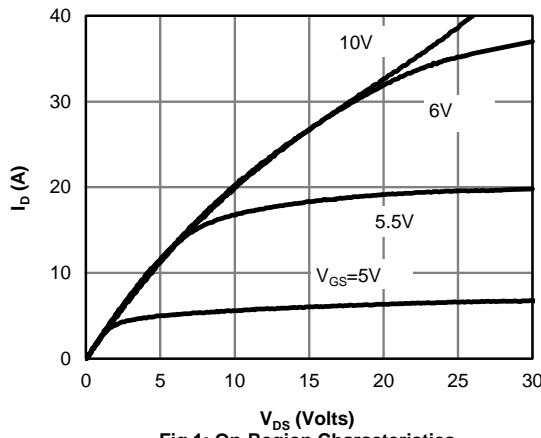
Electrical Characteristics (T_J=25°C unless otherwise noted)

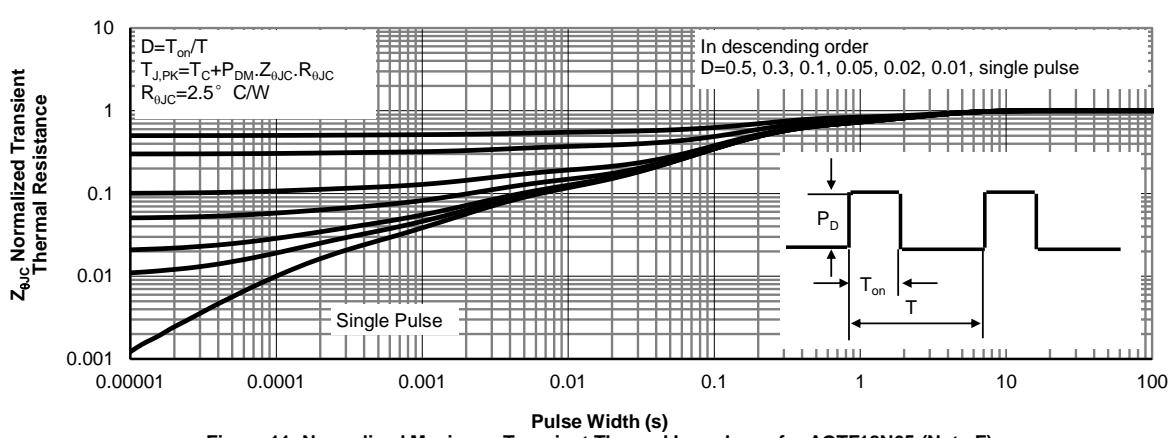
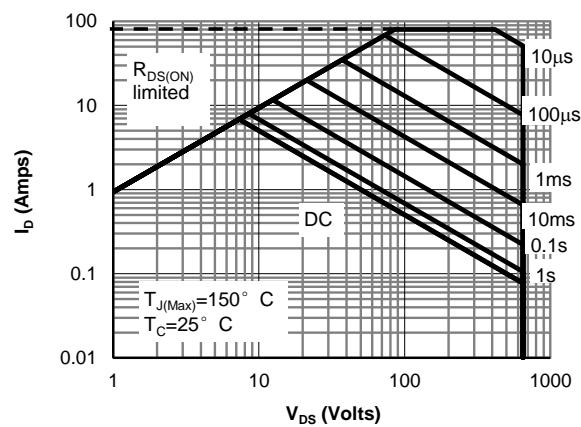
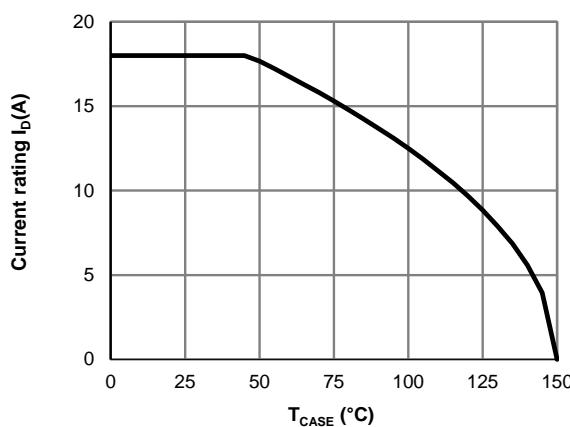
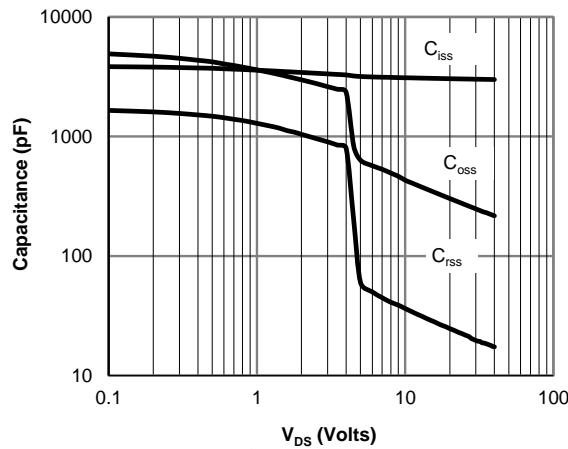
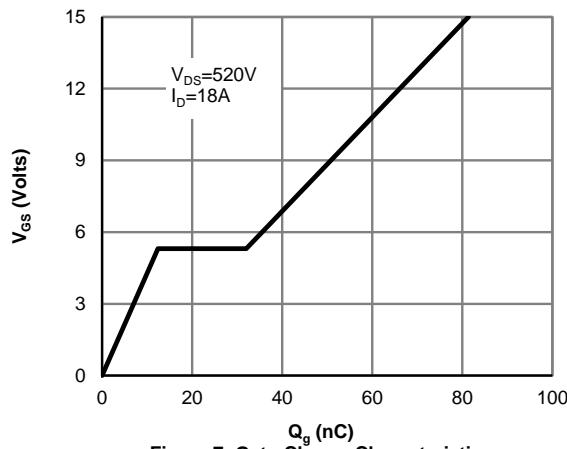
Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =250μA, V _{GS} =0V, T _J =25°C	650			V
		I _D =250μA, V _{GS} =0V, T _J =150°C		750		
BV _{DSS} /ΔT _J	Breakdown Voltage Temperature Coefficient	I _D =250μA, V _{GS} =0V		0.7		V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =650V, V _{GS} =0V		1		μA
		V _{DS} =520V, T _J =125°C			10	
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} =±30V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =5V, I _D =250μA	2.9	3.5	4.5	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =9A		0.32	0.39	Ω
g _{FS}	Forward Transconductance	V _{DS} =40V, I _D =9A		20		S
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.69	1	V
I _S	Maximum Body-Diode Continuous Current*				18	A
I _{SM}	Maximum Body-Diode Pulsed Current				80	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, f=1MHz	2270	3027	3785	pF
C _{oss}	Output Capacitance		170	271	370	pF
C _{rss}	Reverse Transfer Capacitance		12	22	32	pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	0.7	1.4	2.1	Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =520V, I _D =18A	44	56	68	nC
	Gate Source Charge		9	12.4	15	nC
	Gate Drain Charge		9	19.6	30	nC
t _{D(on)}	Turn-On DelayTime	V _{GS} =10V, V _{DS} =325V, I _D =18A, R _G =25Ω		54		ns
t _r	Turn-On Rise Time			83		ns
t _{D(off)}	Turn-Off DelayTime			149		ns
t _f	Turn-Off Fall Time			71		ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =18A, dI/dt=100A/μs, V _{DS} =100V	520	655	790	ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =18A, dI/dt=100A/μs, V _{DS} =100V	8	10	12	μC

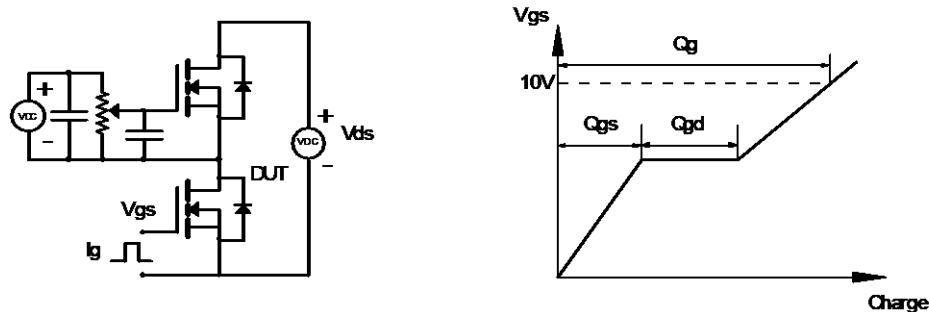
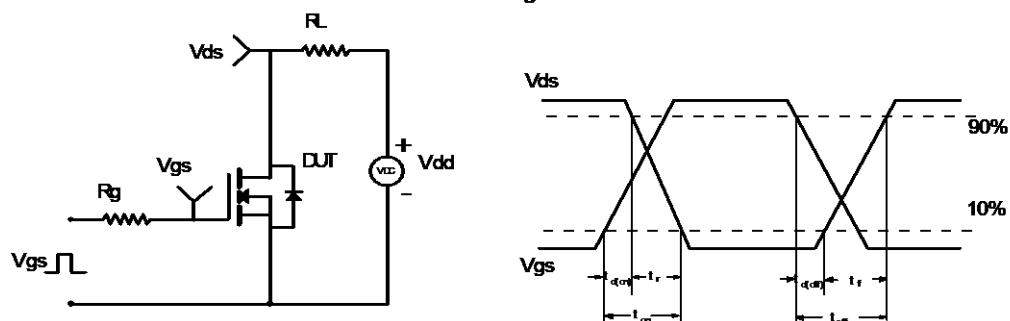
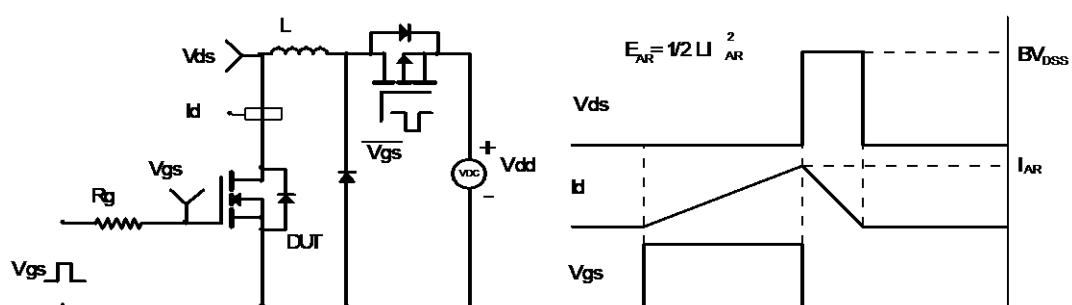
A. The value of R_{DS(on)} is measured with the device in a still air environment with T_A=25°C.
 B. The power dissipation P_D is based on T_{J(MAX)}=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
 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_{DS(on)} is the sum of the thermal impedance from junction to case R_{DC} 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. The SOA curve provides a single pulse rating.
 G. L=60mH, I_{AS}=6.3A, V_{DD}=150V, R_G=25Ω, Starting T_J=25°C

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