

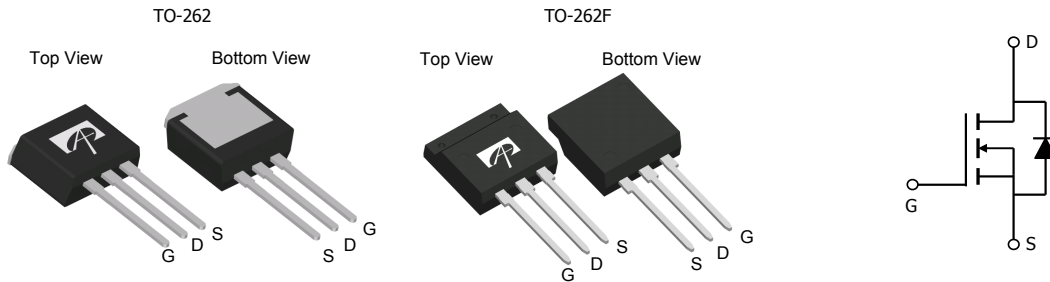
General Description

The AOW10N60 & AOWF10N60 have been 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 these parts can be adopted quickly into new and existing offline power supply designs.

Product Summary

V_{DS}	700V@150°C
I_D (at $V_{GS}=10V$)	10A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	< 0.75Ω

100% UIS Tested
 100% R_g Tested



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

Parameter	Symbol	AOW10N60	AOWF10N60	Units
Drain-Source Voltage	V_{DS}	600		V
Gate-Source Voltage	V_{GS}	±30		V
Continuous Drain Current	I_D	$T_C=25^\circ C$	10	10*
		$T_C=100^\circ C$	7.2	7.2*
Pulsed Drain Current ^C	I_{DM}	36		A
Avalanche Current ^C	I_{AR}	4.4		A
Repetitive avalanche energy ^C	E_{AR}	290		mJ
Single pulsed avalanche energy ^G	E_{AS}	580		mJ
Peak diode recovery dv/dt	dv/dt	5		V/ns
Power Dissipation ^B	P_D	$T_C=25^\circ C$	250	28
		Derate above 25°C	2	0.22
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	AOW10N60	AOWF10N60	Units
Maximum Junction-to-Ambient ^{A,D}	$R_{\theta JA}$	65	65	°C/W
Maximum Case-to-sink ^A	$R_{\theta CS}$	0.5	--	°C/W
Maximum Junction-to-Case	$R_{\theta JC}$	0.5	4.5	°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 I _D =250μA, V _{GS} =0V, T _J =150°C	600			V
BV _{DSS} /ΔT _J	Breakdown Voltage Temperature Coefficient	I _D =250μA, V _{GS} =0V		0.65		V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =600V, V _{GS} =0V V _{DS} =480V, T _J =125°C			1 10	μA
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	3	4	4.5	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =5A		0.6	0.75	Ω
g _{FS}	Forward Transconductance	V _{DS} =40V, I _D =5A		15		S
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.73	1	V
I _S	Maximum Body-Diode Continuous Current				10	A
I _{SM}	Maximum Body-Diode Pulsed Current				36	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, f=1MHz	1100	1320	1600	pF
C _{oss}	Output Capacitance		105	130	170	pF
C _{rss}	Reverse Transfer Capacitance		7.5	9.3	14	pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	3	3.8	6	Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =480V, I _D =10A		31	40	nC
Q _{gs}	Gate Source Charge		6	10	nC	
Q _{gd}	Gate Drain Charge		14.4	22	nC	
t _{D(on)}	Turn-On Delay Time	V _{GS} =10V, V _{DS} =300V, I _D =10A, R _G =25Ω		28	35	ns
t _r	Turn-On Rise Time		66	80	ns	
t _{D(off)}	Turn-Off Delay Time		76	95	ns	
t _f	Turn-Off Fall Time		64	80	ns	
t _{rr}	Body Diode Reverse Recovery Time		I _F =10A, di/dt=100A/μs, V _{DS} =100V		290	350
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =10A, di/dt=100A/μs, V _{DS} =100V		3.9	4.7	μC

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 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_{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. The SOA curve provides a single pulse rating.

G. L=60mH, I_{AS}=4.4A, V_{DD}=150V, R_G=25Ω, Starting T_J=25°C

THIS PRODUCT HAS BEEN DESIGNED AND QUALIFIED FOR THE CONSUMER MARKET. APPLICATIONS OR USES AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS ARE NOT AUTHORIZED. AOS DOES NOT ASSUME ANY LIABILITY ARISING OUT OF SUCH APPLICATIONS OR USES OF ITS PRODUCTS. AOS RESERVES THE RIGHT TO IMPROVE PRODUCT DESIGN, FUNCTIONS AND RELIABILITY WITHOUT NOTICE.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

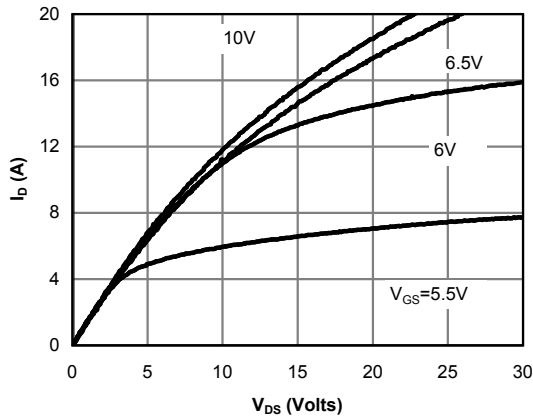


Fig 1: On-Region Characteristics

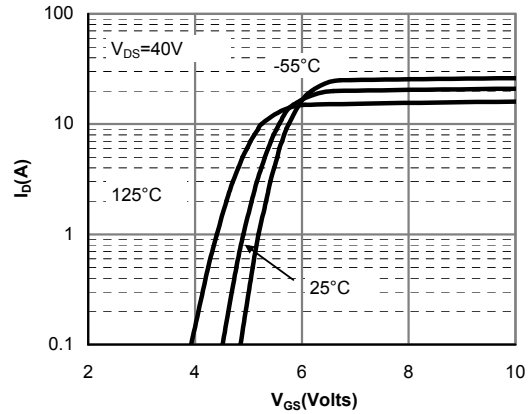


Figure 2: Transfer Characteristics

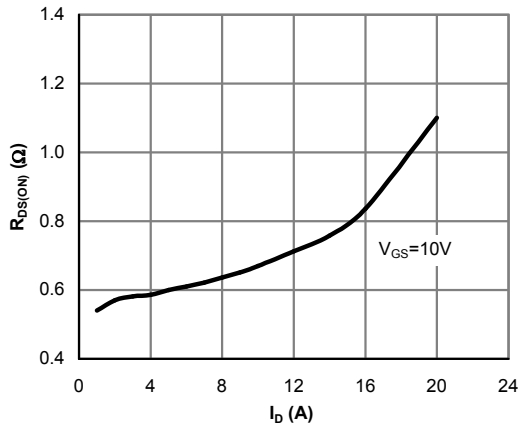


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

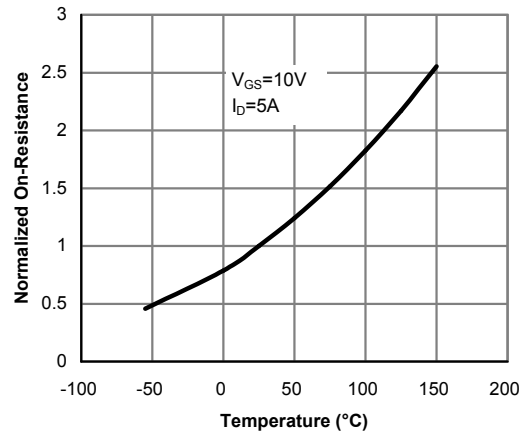


Figure 4: On-Resistance vs. Junction Temperature

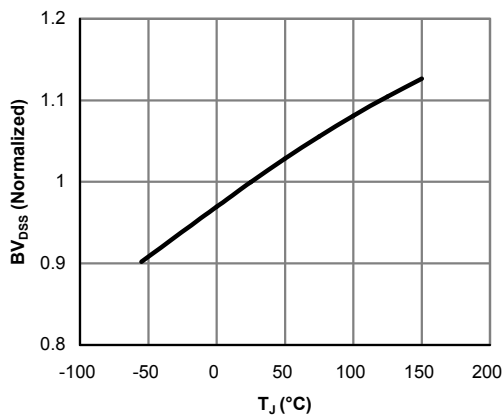


Figure 5: Break Down vs. Junction Temperature

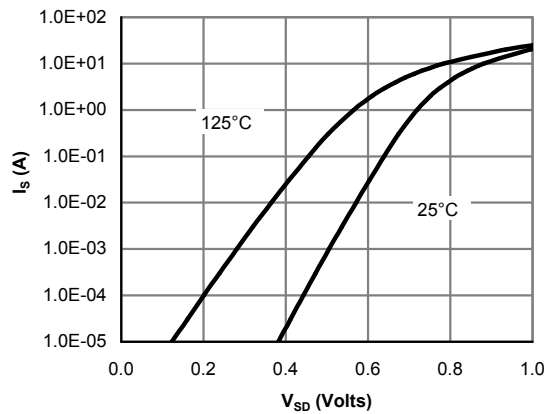


Figure 6: Body-Diode Characteristics (Note E)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

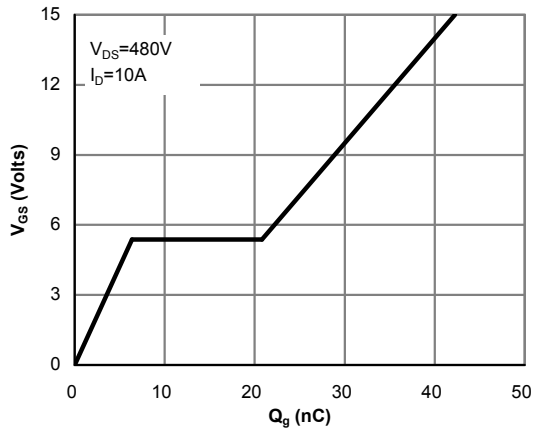


Figure 7: Gate-Charge Characteristics

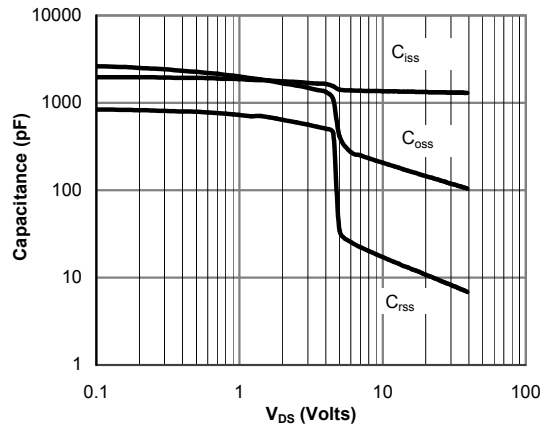


Figure 8: Capacitance Characteristics

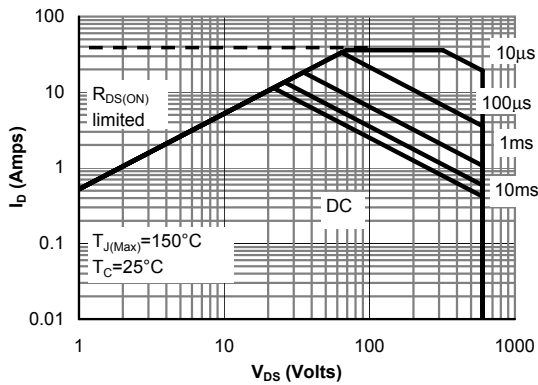


Figure 9: Maximum Forward Biased Safe Operating Area for AOW10N60 (Note F)

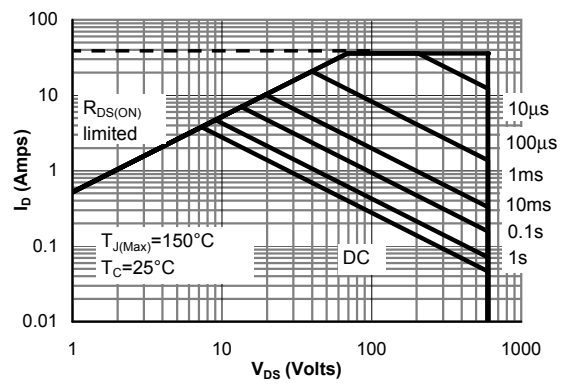


Figure 10: Maximum Forward Biased Safe Operating Area for AOWF10N60 (Note F)

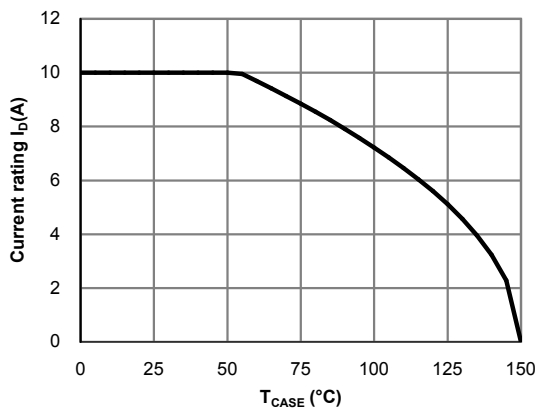


Figure 11: Current De-rating (Note B)

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

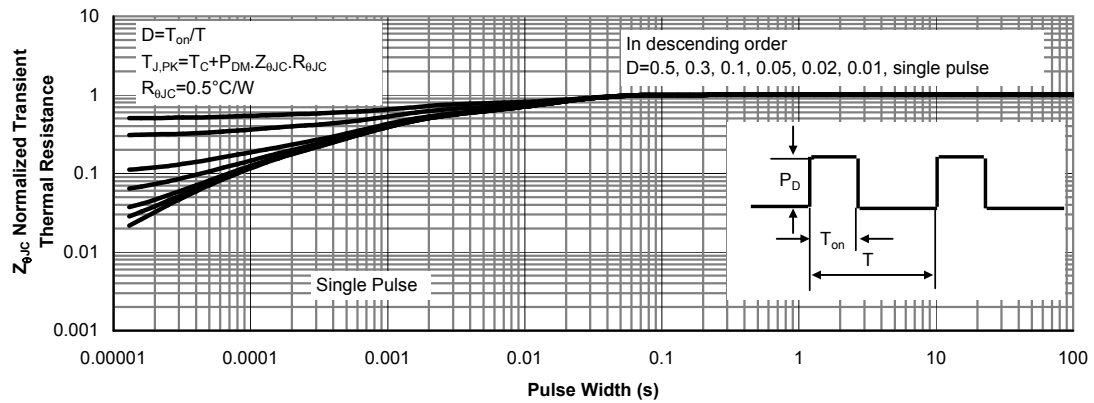


Figure 12: Normalized Maximum Transient Thermal Impedance for AOW10N60 (Note F)

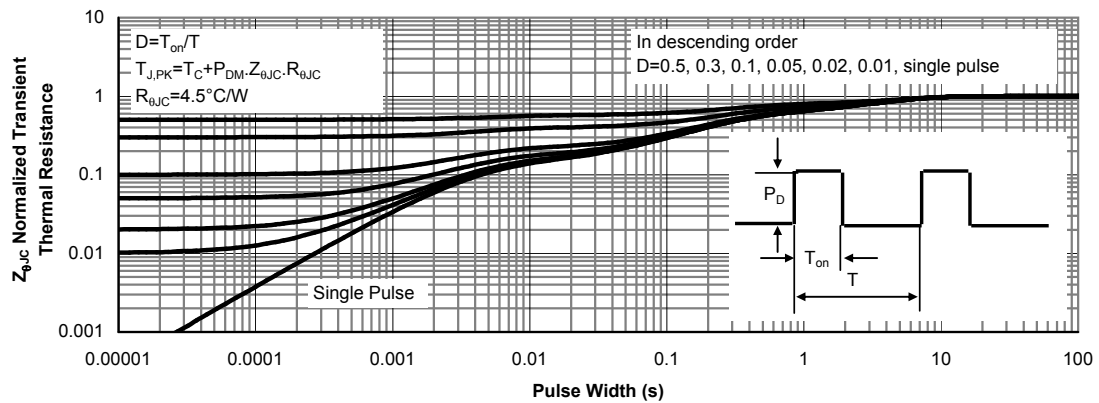
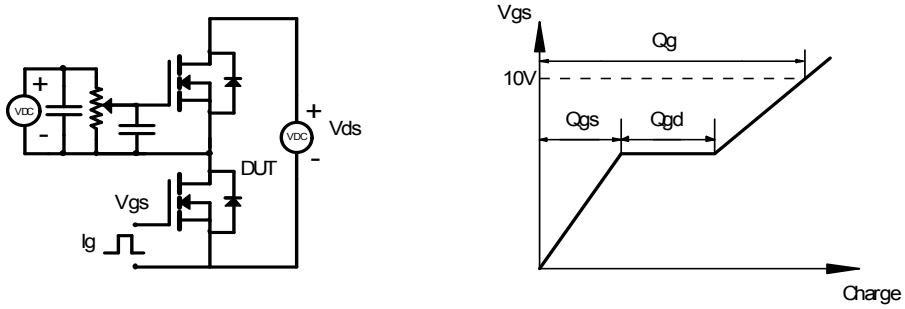
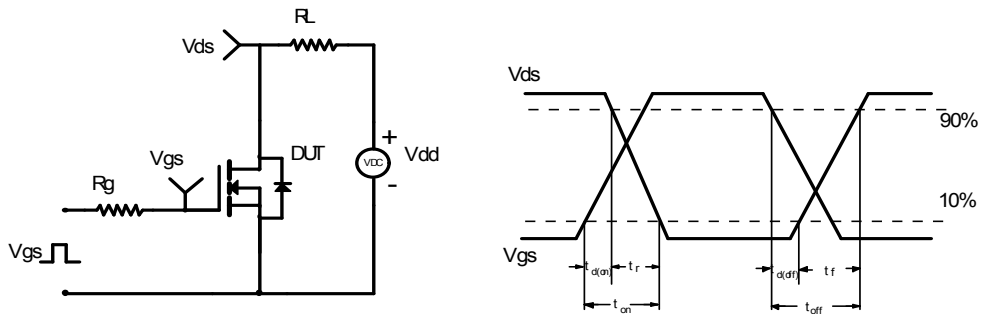


Figure 13: Normalized Maximum Transient Thermal Impedance for AOWF10N60 (Note F)

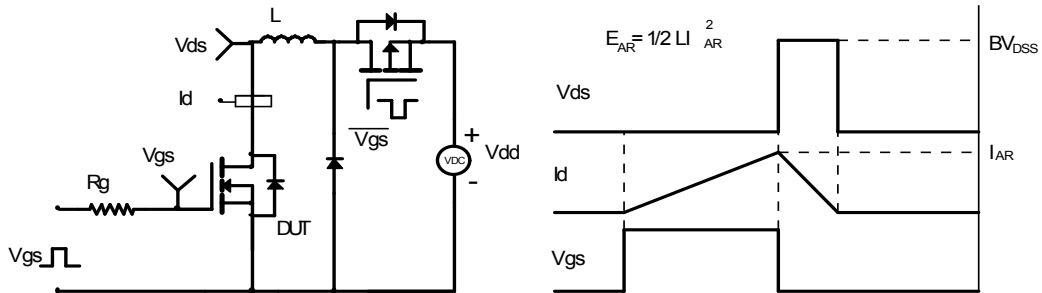
Gate Charge Test Circuit & Waveform



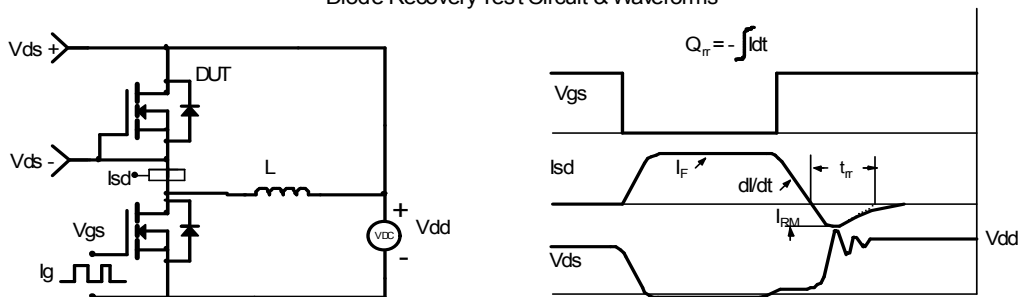
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



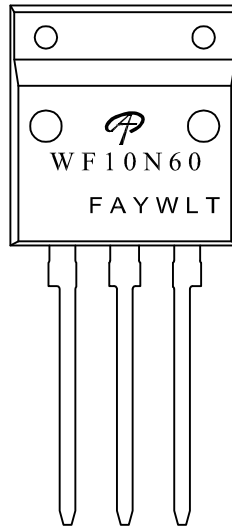
Diode Recovery Test Circuit & Waveforms





Document No.	PD-01257
Version	A
Title	AOWF10N60 Marking Description

TO262F PACKAGE MARKING DESCRIPTION



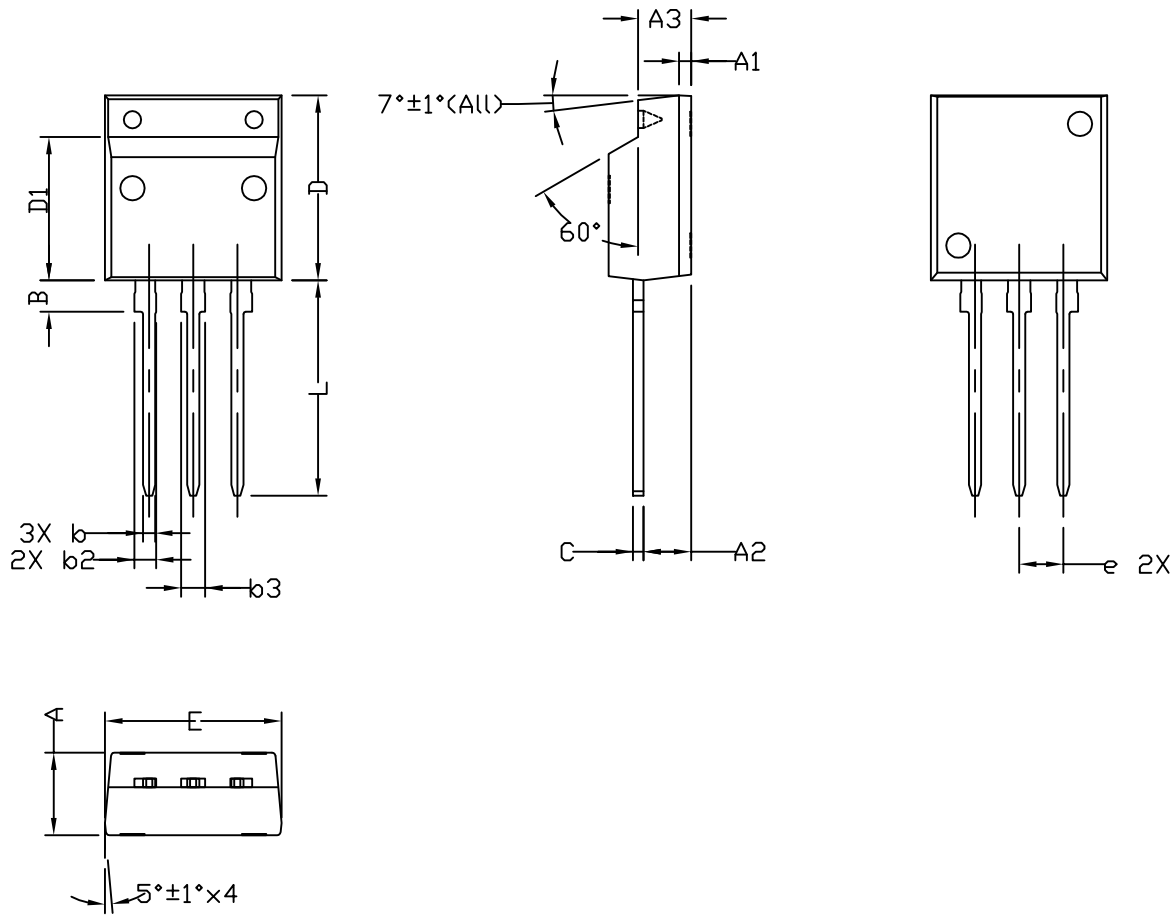
Green product

NOTE:	
LOGO	- AOS Logo
WF10N60	- Part number code
F	- Fab code
A	- Assembly location code
Y	- Year code
W	- Week code
L&T	- Assembly lot code

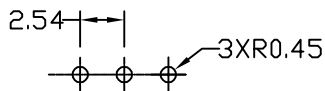
PART NO.	DESCRIPTION	CODE
AOWF10N60	Green product	WF10N60
AOWF10N60L	Green product	WF10N60



TO262F PACKAGE OUTLINE



RECOMMENDED LAND PATTERN



SYMBOL	DIMENSIONAL REQMTS			INCHES REQMTS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.66	4.76	4.86	0.183	0.187	0.191
A1	0.65	0.70	0.75	0.026	0.028	0.030
A2	2.61	2.76	2.91	0.103	0.109	0.115
A3	2.91	3.06	3.21	0.115	0.120	0.126
B	1.65	1.80	2.00	0.065	0.071	0.079
b	0.59	0.69	0.79	0.023	0.027	0.031
b2	1.14	1.25	1.29	0.045	0.049	0.051
b3	1.28	1.38	1.43	0.050	0.054	0.056
c	0.55	0.60	0.70	0.022	0.024	0.028
D	10.45	10.65	10.85	0.411	0.419	0.427
D1	8.05	8.25	8.45	0.317	0.325	0.333
E	9.70	10.15	10.54	0.382	0.400	0.415
e	2.54 BSC			0.100 BSC		
L	12.27	12.40	13.48	0.483	0.488	0.531

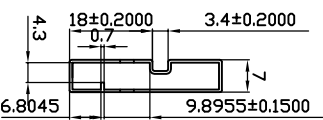
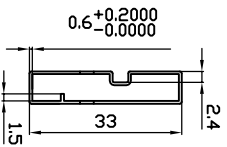
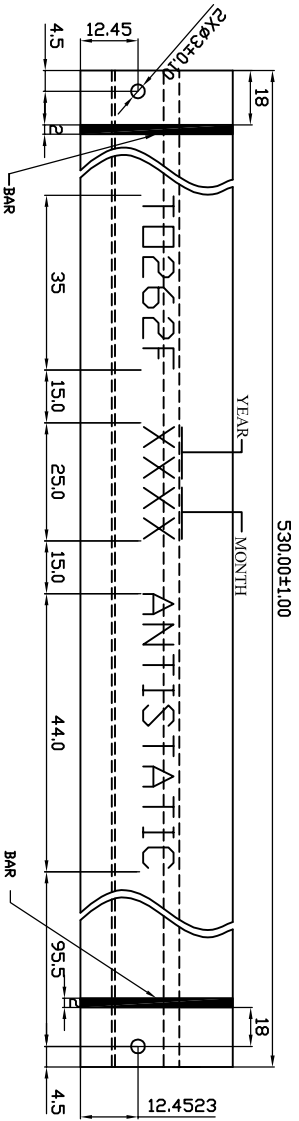
NOTE

1. CONTROLLING DIMENSION IS MILLIMETER.
CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.



ALPHA & OMEGA
SEMICONDUCTOR

TO262F PLASTIC TUBE DRAWING



1. ALL TUBE TOLERANCES TO BE ±0.20 UNLESS OTHERWISE SPECIFIED.
2. ALL RADIUS AND ANGLES REFERENCE CAMBER'S MAX.
3. ENTIRE TUBE MUST MEET ANTISTATIC TESTING CRITERIA PER MIL-STD-81705B AND ASTM-D257.
4. MATERIAL: PET, ANTISTATIC TREATED UNLESS OTHERWISE SPECIFIED.

OPTION	TUBE COLOR	PRINT COLOR	BAR COLOR
1	TRANSPARANANCE	BLACK	BLUE
2	RED	BLACK	BLUE
3	YELLOW	BLACK	BLUE

7. PACKING QTY :

PKG	QTY(PCS)
TO262F	50

REV	DATE	DESCRIPTION	DRG
A		NEW ISSUE	

		ALPHA & OMEGA SEMICONDUCTOR		TITLE TO262F TUBE DRAWING	
DRAWN BY	SIGNATURE	UNIT	MM	PAGE	1 OF 1
APPROVED BY	SIGNATURE	DRAWING NUMBER	TR-00064	REVISION	REV A
SCALE	N.T.S.	PROJECTION		REVISION CODE	REV A