

Product Summary

- $V_{DS} = 700V, I_D = 15A$
- $R_{DS(on)} < 0.65\Omega$ @ $V_{GS} = 10V$

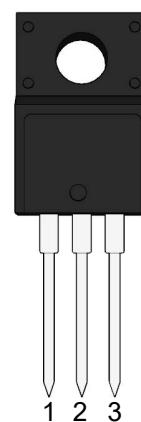
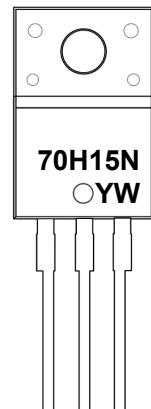
Features

- Advanced Planar Technology
- 100% Avalanche Tested
- RoHS Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 3

Application

- High Efficiency Switch Mode Power Supplies
- Electronic Ballasts
- UPS

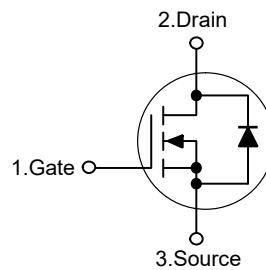
Marking Code



(Top View)

Pin	Description
1	Gate
2	Drain
3	Source

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25°C case temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	700	V
Gate-Source Voltage	V_{GS}	± 30	V
Drain Current-Continuous	I_D	15	A
Drain Current-Pulsed ^{Note1}	I_{DM}	40	A
Maximum Power Dissipation	P_D	50	W
Single Pulse Avalanche Energy ^{Note2}	E_{AS}	245	mJ
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance, Junction-to-Case	R_{eJC}	2.5	°C/W
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Electrical Characteristics

(T_J=25°C unless otherwise specified)

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	600			V
		I _D =250μA, V _{GS} =0V, T _J =150°C		700		
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		1		μA
		V _{DS} =480V, 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	3	4	4.5	V
R _{DSS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =6A		0.46	0.55	Ω
g _{FS}	Forward Transconductance	V _{DS} =40V, I _D =6A		20		S
V _{SD}	Diode Forward Voltage	I _S =1A, V _{GS} =0V		0.72	1	V
I _S	Maximum Body-Diode Continuous Current				12	A
I _{SM}	Maximum Body-Diode Pulsed Current				48	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V, f=1MHz	1400	1751	2100	pF
C _{oss}	Output Capacitance		130	164	200	pF
C _{rss}	Reverse Transfer Capacitance		10	13	16	pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	2.5	3.3	5	Ω
SWITCHING PARAMETERS						
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =480V, I _D =15A		40	50	nC
Q _{gs}	Gate Source Charge			9	11	nC
Q _{gd}	Gate Drain Charge			17.9	22	nC
t _{D(on)}	Turn-On Delay Time	V _{GS} =10V, V _{DS} =300V, I _D =15A, R _G =25Ω		39	50	ns
t _r	Turn-On Rise Time			70	85	ns
t _{D(off)}	Turn-Off Delay Time			122	150	ns
t _f	Turn-Off Fall Time			74	90	ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =12A, dI/dt=100A/μs, V _{DS} =100V		311	373	ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =12A, dI/dt=100A/μs, V _{DS} =100V		5.2	6.2	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}=5.5A, V_{DD}=150V, R_G=25Ω, Starting T_J=25°C

Typical Characteristic Curves

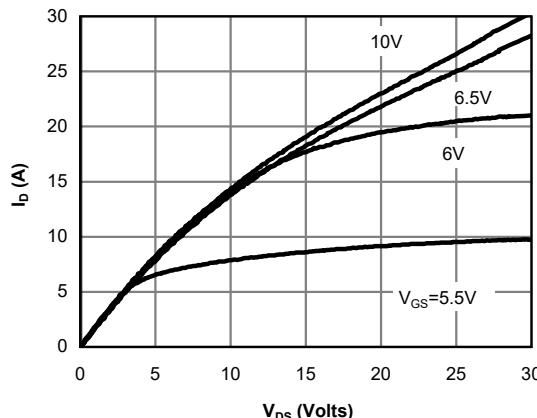


Figure 1: On-Region Characteristics

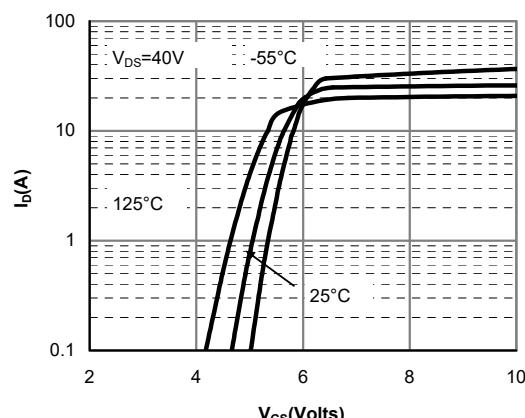
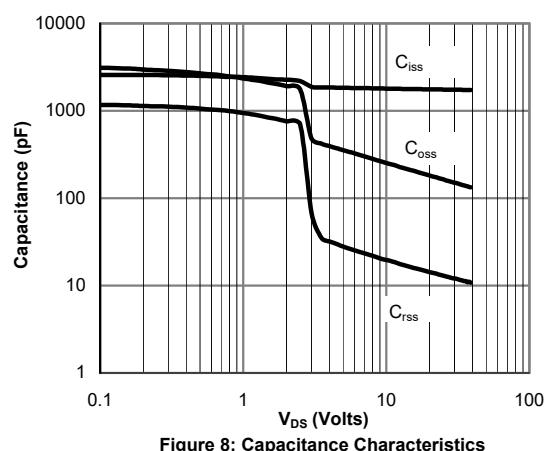
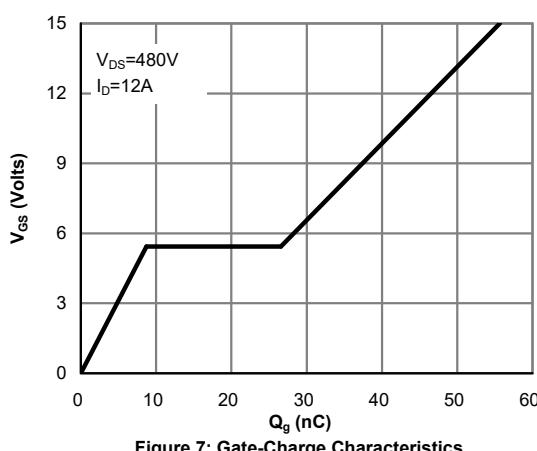
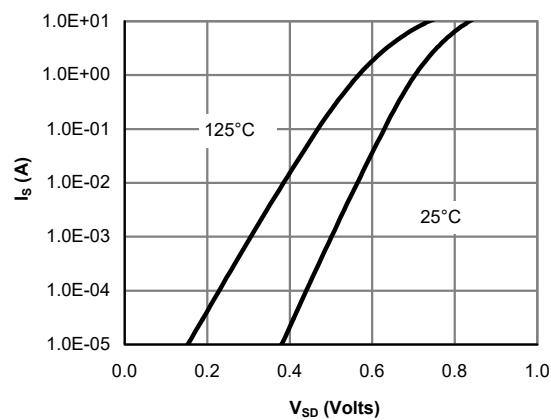
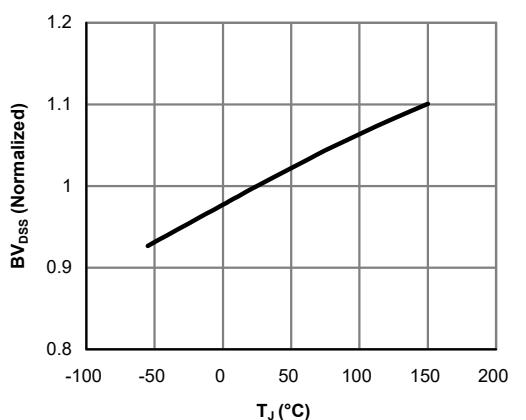
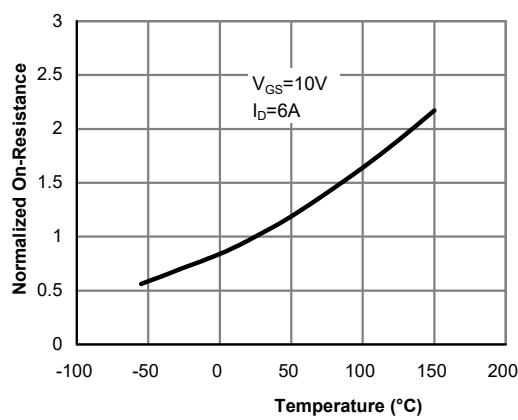
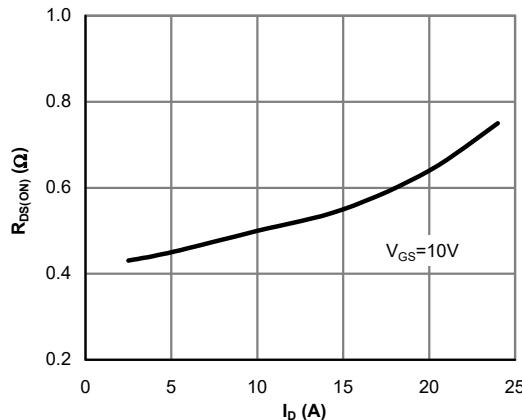


Figure 2: Transfer Characteristics



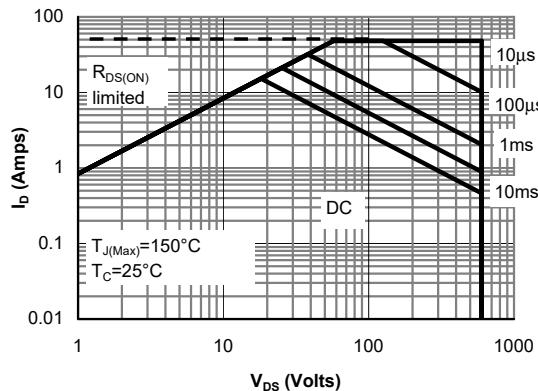


Figure 9: Maximum Forward Biased Safe Operating Area for AOT12N60 (Note F)

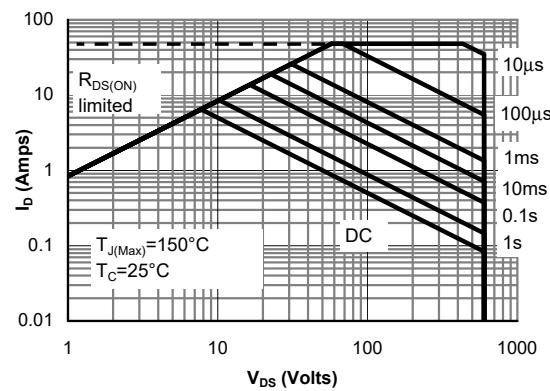


Figure 10: Maximum Forward Biased Safe Operating Area for AOTF12N60 (Note F)

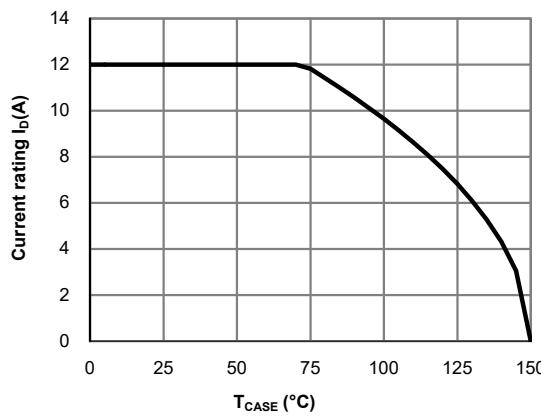


Figure 11: Current De-rating (Note B)

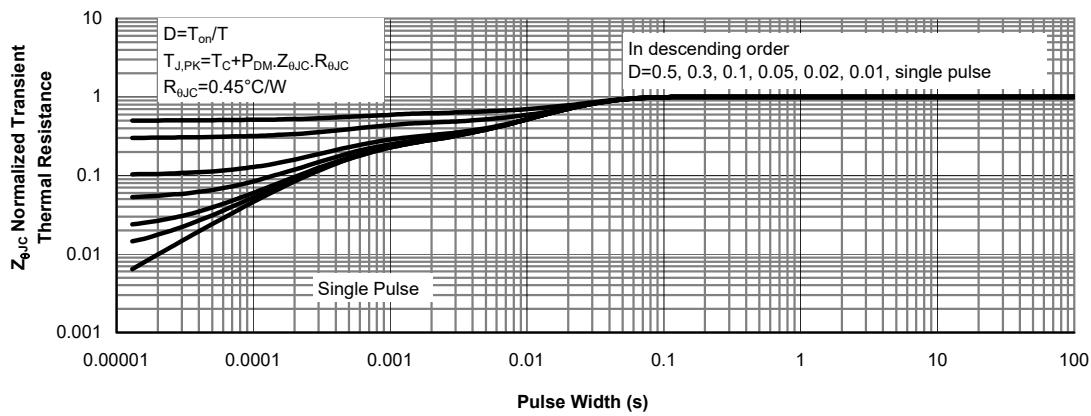


Figure 12: Normalized Maximum Transient Thermal Impedance for AOT12N60 (Note F)

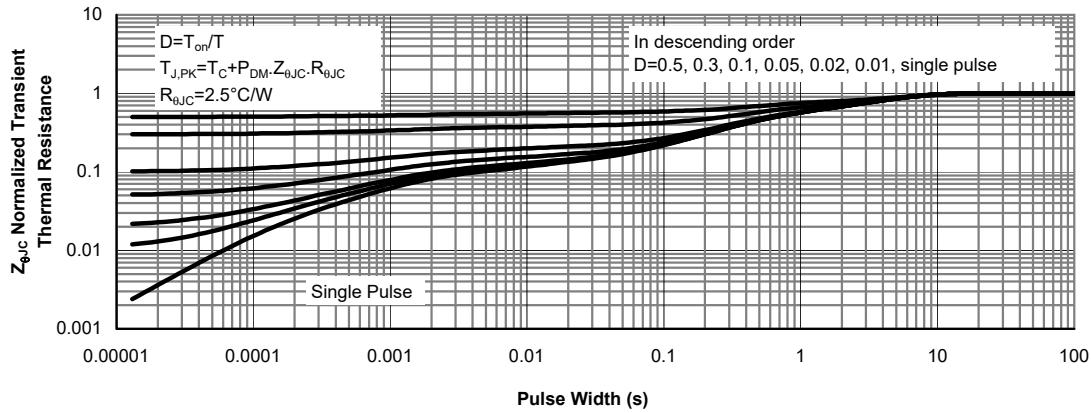
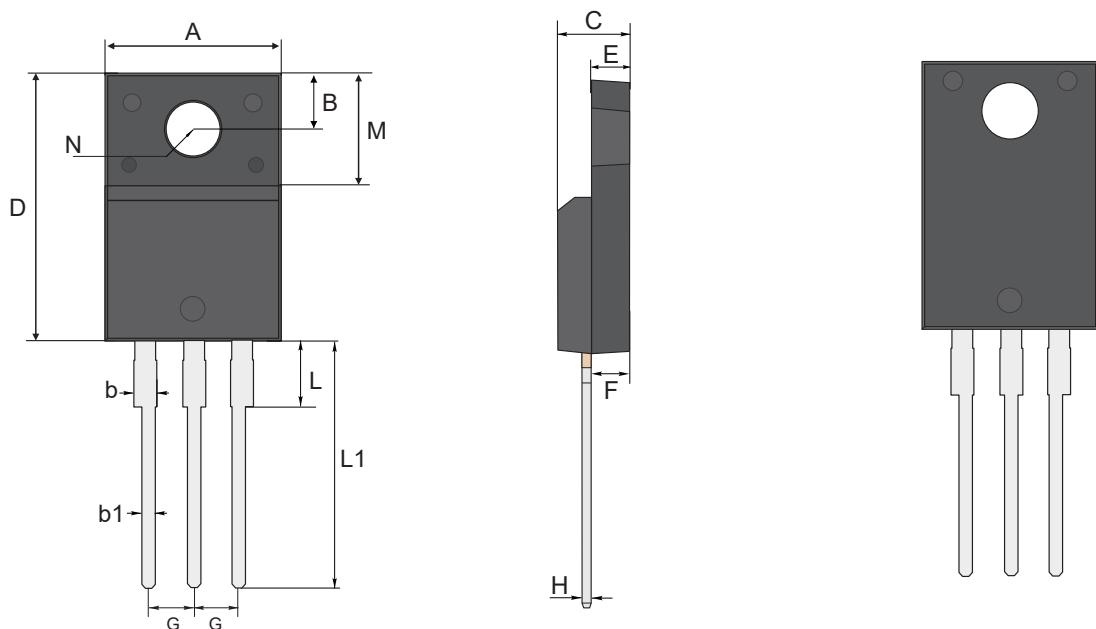


Figure 13: Normalized Maximum Transient Thermal Impedance for AOTF12N60 (Note F)

Package Outline

TO-220F

Dimensions in mm



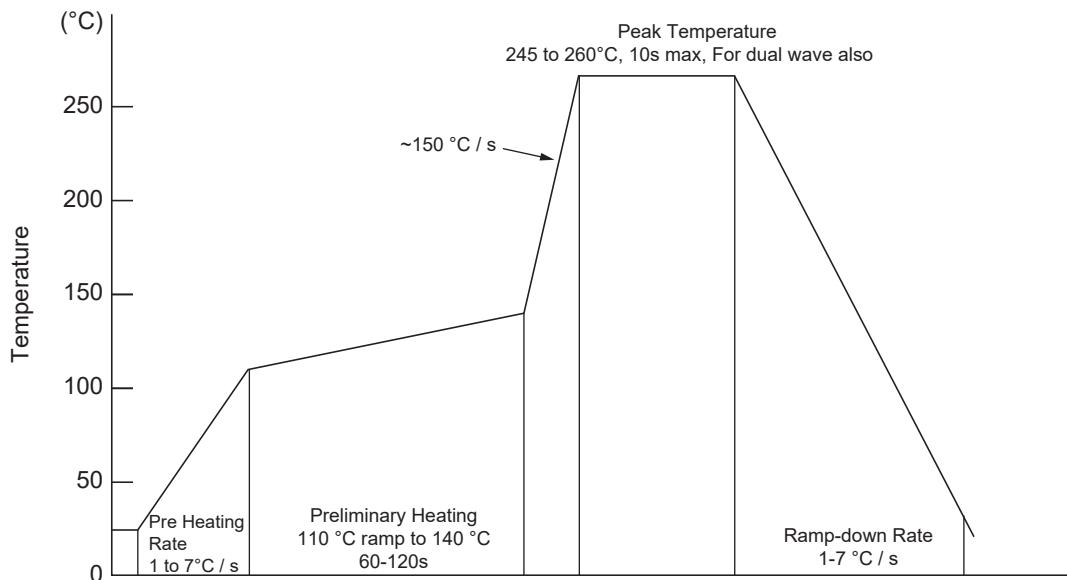
UNIT		A	B	b	b1	C	D	E	F	G	H	L	L1	M	N
mm	max	10.28	3.37	1.44	0.9	4.9	16.07	2.74	2.74	2.64	0.6	2.85	13.7	6.88	3.18 typ.
	typ	10.18	3.27	1.34	0.8	4.7	15.87	2.54	2.54	2.54	0.5	2.65	13.5	6.68	
	min	10.08	3.17	1.24	0.7	4.5	15.67	2.34	2.34	2.44	0.4	2.45	13.3	6.48	
mil	max	405	133	57	35	193	633	108	108	104	24	112	539	271	125 typ.
	typ	401	129	53	31	185	625	100	100	100	20	104	531	263	
	min	397	125	49	28	177	617	92	92	96	16	96	524	255	

Ordering Information

Device	Package	Shipping
TN70H15NTF	TO-220F	50PCS/Tube

Conditions of Soldering and Storage

◆ Wave Soldering



◆ Conditions of hand soldering

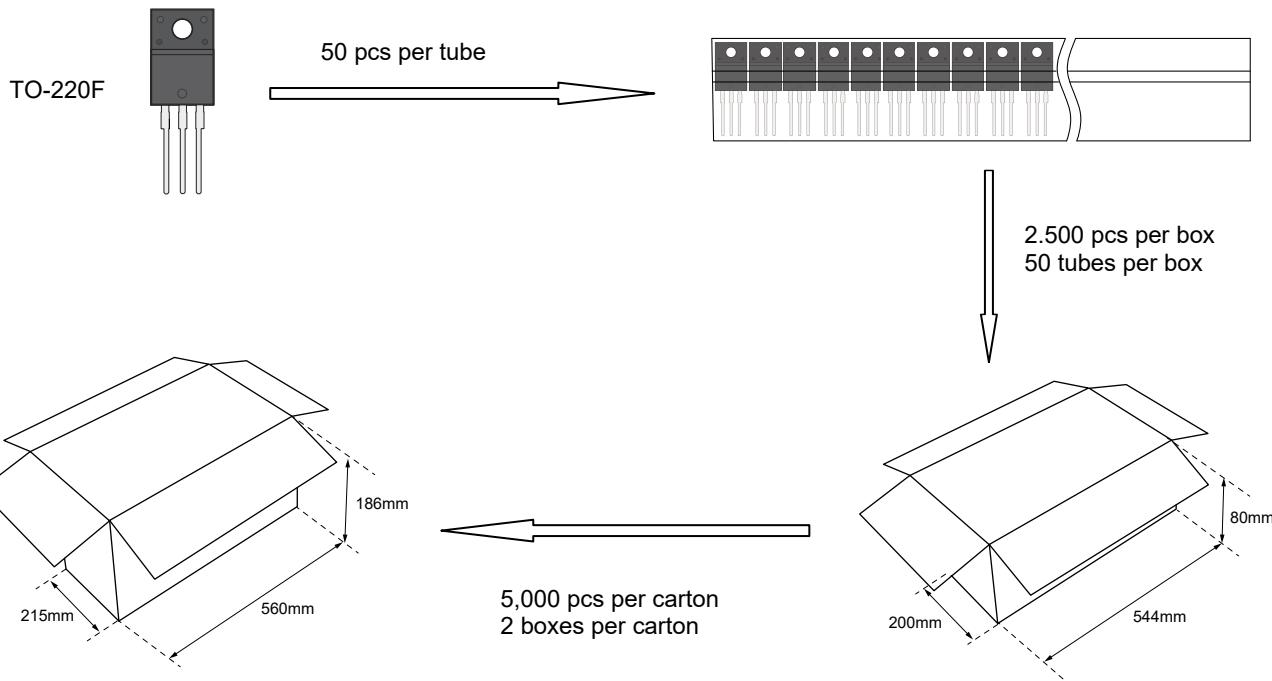
- Temperature: 360°C
- Time: 3s max.
- Times: one time

◆ Storage conditions

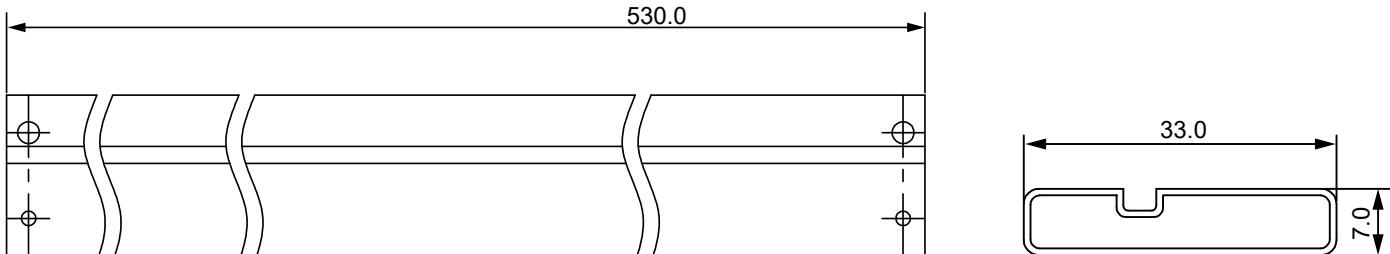
- **Temperature**
5 to 40°C
- **Humidity**
30 to 80% RH
- **Recommended period**
One year after manufacturing

Package Specifications

- The method of packaging



◆ Tube data



Contact Information

TANI website: <http://www.tanisemi.com> Email: tani@tanisemi.com

For additional information, please contact your local Sales Representative.



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Product Specification Statement

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