

TN70H20NTF

N-Channel Enhancement Mode Power MOSFET TO-220F

Product Summary

- $V_{DS} = 700V, I_D = 20A$
- $R_{DS(on)} < 0.6\Omega @ V_{GS} = 10V$

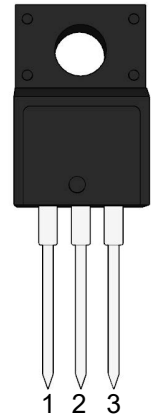
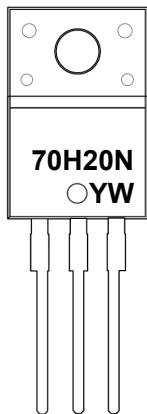
Features

- 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

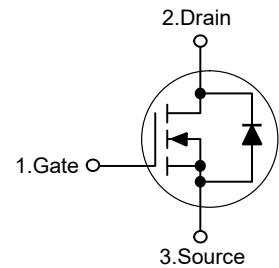
Marking Code



(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	20	A
Drain Current-Pulsed ^{Note1}	I_{DM}	40	A
Maximum Power Dissipation	P_D	50	W
Single Pulse Avalanche Energy ^{Note2}	E_{AS}	590	mJ
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.77	°C/W
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Electrical Characteristics

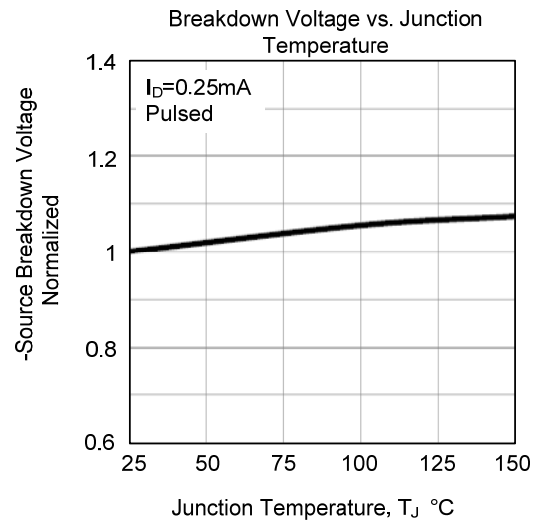
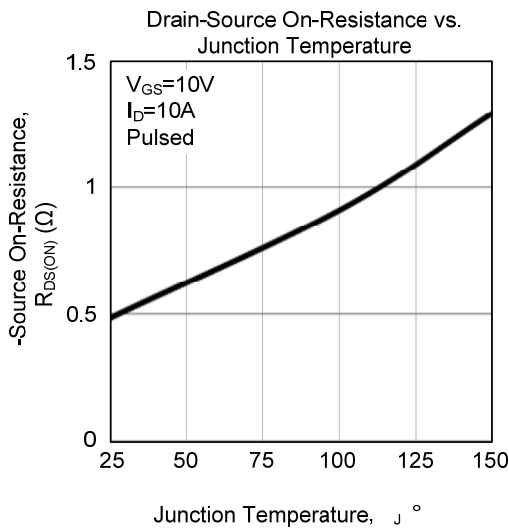
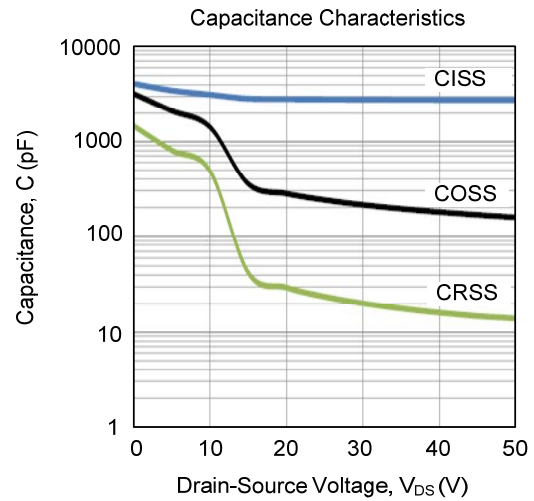
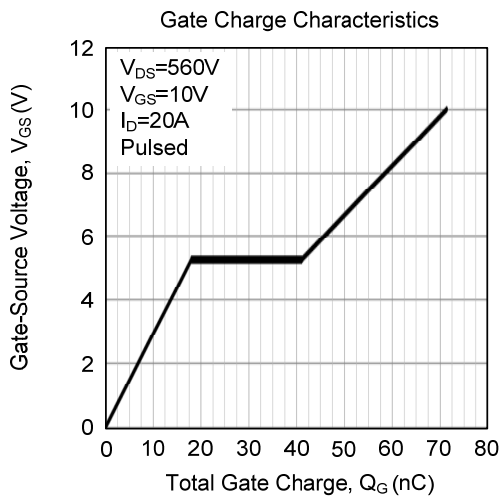
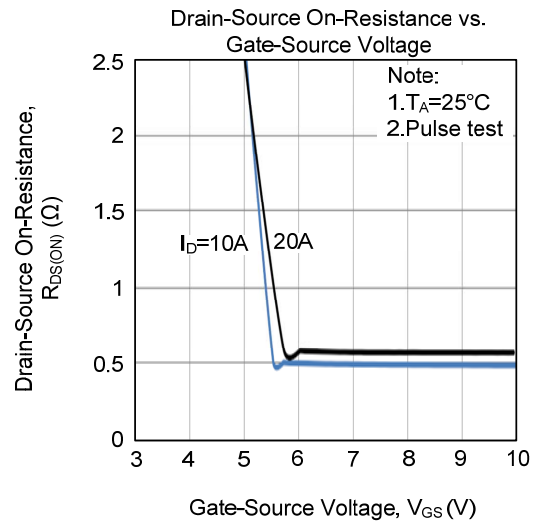
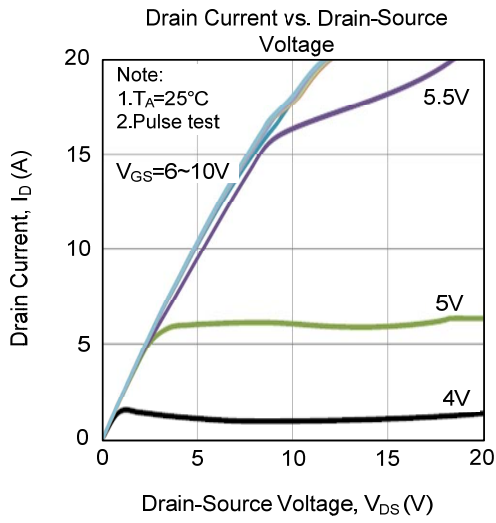
(T_J=25°C unless otherwise specified)

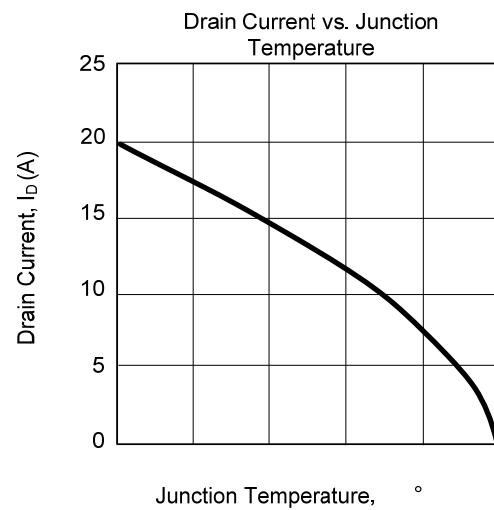
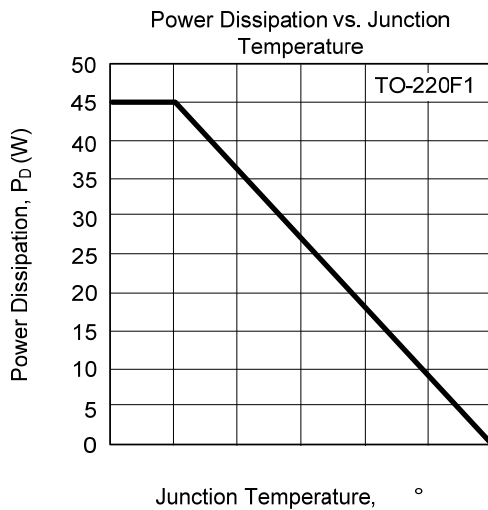
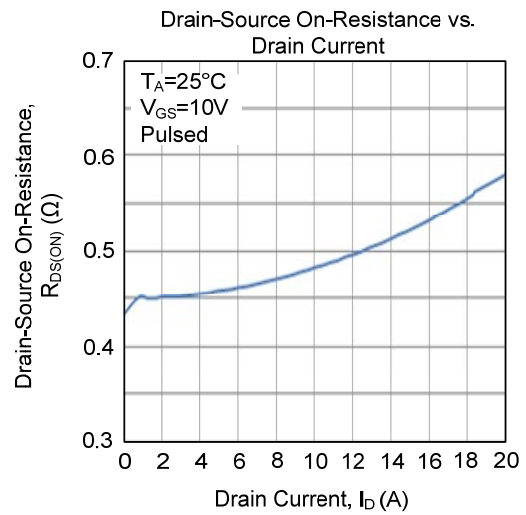
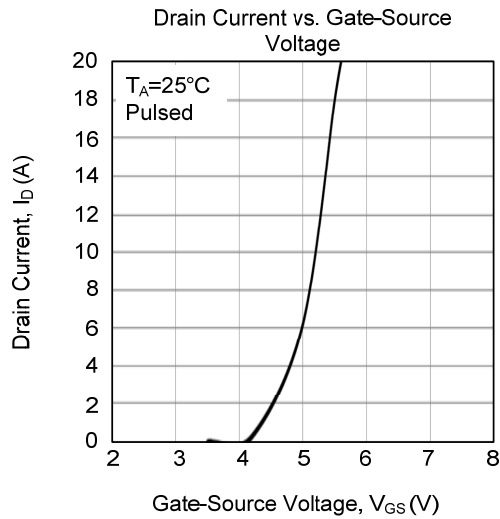
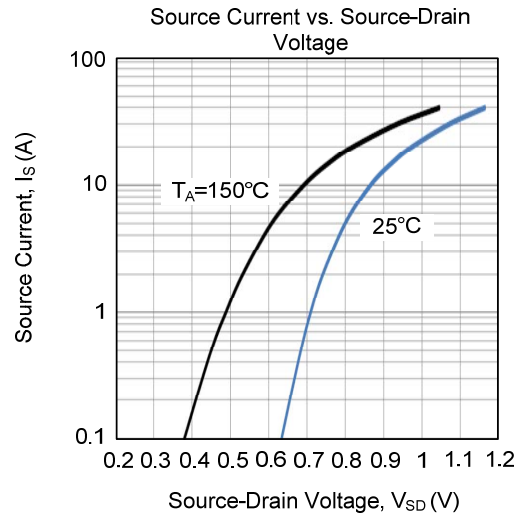
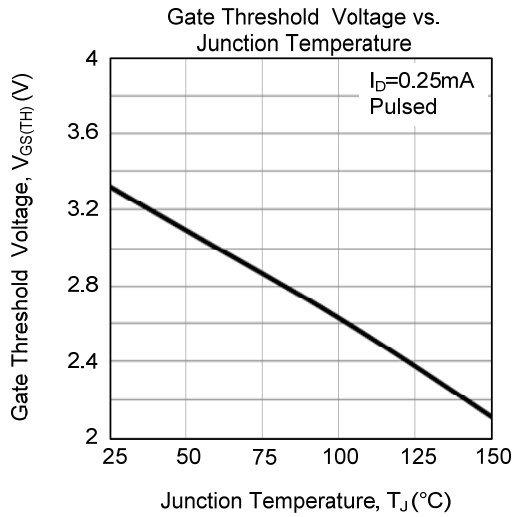
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V				V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =700V, V _{GS} =0V			10	μA
Gate-Source Leakage Current	Forward	V _{GS} =+30V, V _{DS} =0V V _{GS} =-30V, V _{DS} =0V			+100	nA
	Reverse				-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =10A		0.5	0.6	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz		2800		pF
Output Capacitance	C _{OSS}			240		pF
Reverse Transfer Capacitance	C _{RSS}			23		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{DS} =560V, V _{GS} =10V, I _D =20A I _G =1mA (Note 1, 2)		70		nC
Gate to Source Charge	Q _{GS}			18		nC
Gate to Drain Charge	Q _{GD}			23		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =100V, V _{GS} =10V, I _D =20A, R _G =25Ω (Note 1, 2)		40		ns
Rise Time	t _R			30		ns
Turn-OFF Delay Time	t _{D(OFF)}			210		ns
Fall-Time	F			56		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				20	A
Maximum Body-Diode Pulsed Current	I _{SM}				40	A
Drain-Source Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V			1.4	V
Body Diode Reverse Recovery Time	t _{rr}	I _S =20A, V _{GS} =0V, dI _F /dt=100A/μs (Note 1)		508		ns
Reverse Recovery Charge	Q _{rr}				9.6	

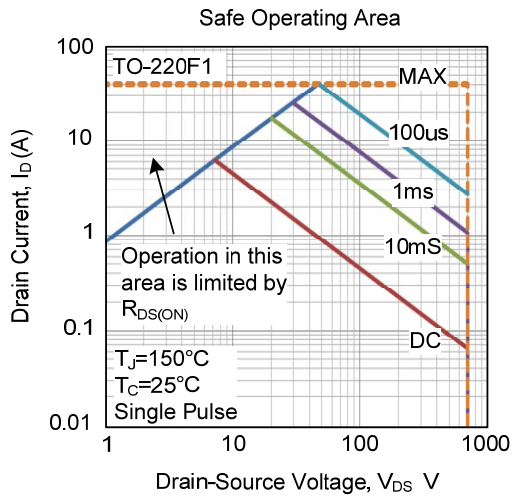
Notes: 1. Pulse Test: Pulse width ≤ 700μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

Typical Characteristic Curves



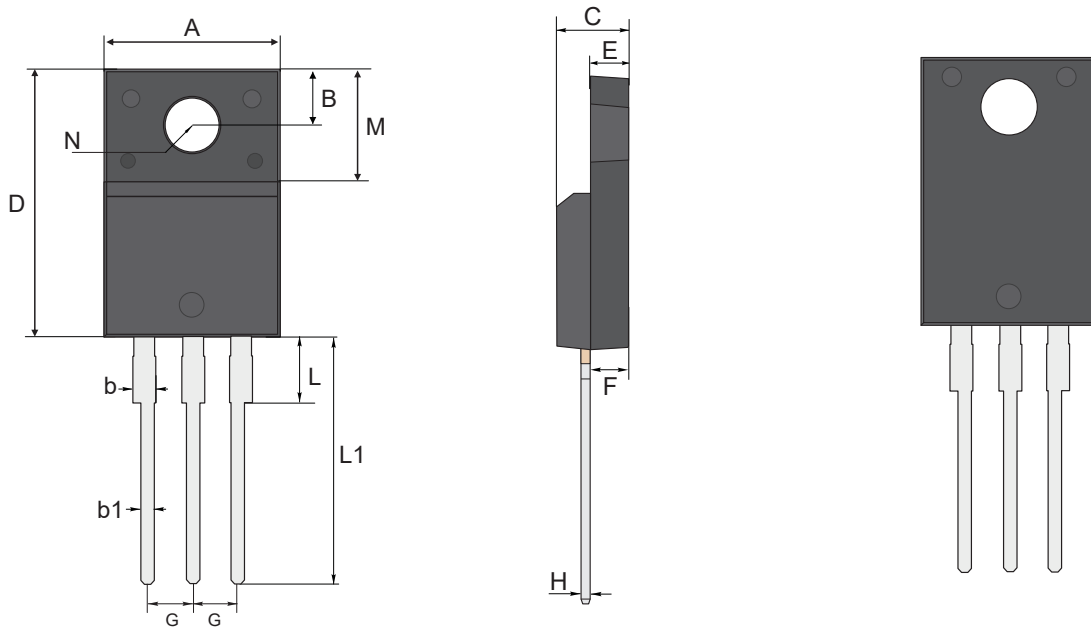




Package Outline

TO-220F

Dimensions in mm



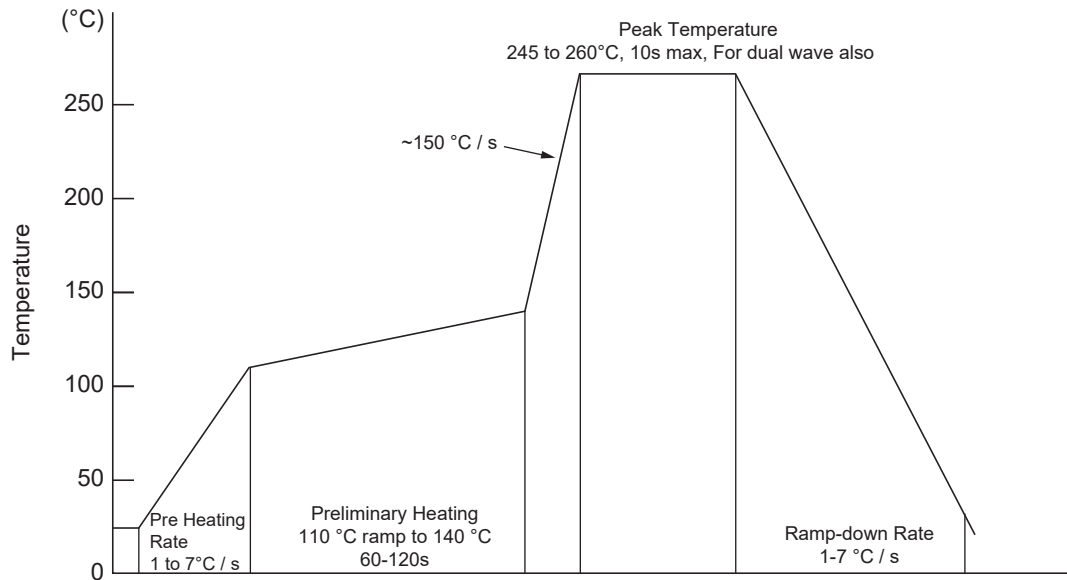
UNIT		A	B	b	b1	C	D	E	F	G	H	L	L1	M	N
mm	max	10.28	3.37	1.44	0.9	4.9	16.07	2.74	2.74	2.64	0.6	2.85	13.7	6.88	3.18 typ.
	typ	10.18	3.27	1.34	0.8	4.7	15.87	2.54	2.54	2.54	0.5	2.65	13.5	6.68	
	min	10.08	3.17	1.24	0.7	4.5	15.67	2.34	2.34	2.44	0.4	2.45	13.3	6.48	
mil	max	405	133	57	35	193	633	108	108	104	24	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
TN70H20NTF	TO-220F	50PCS/Tube

Conditions of Soldering and Storage

◆ Wave Soldering



◆ Conditions of hand soldering

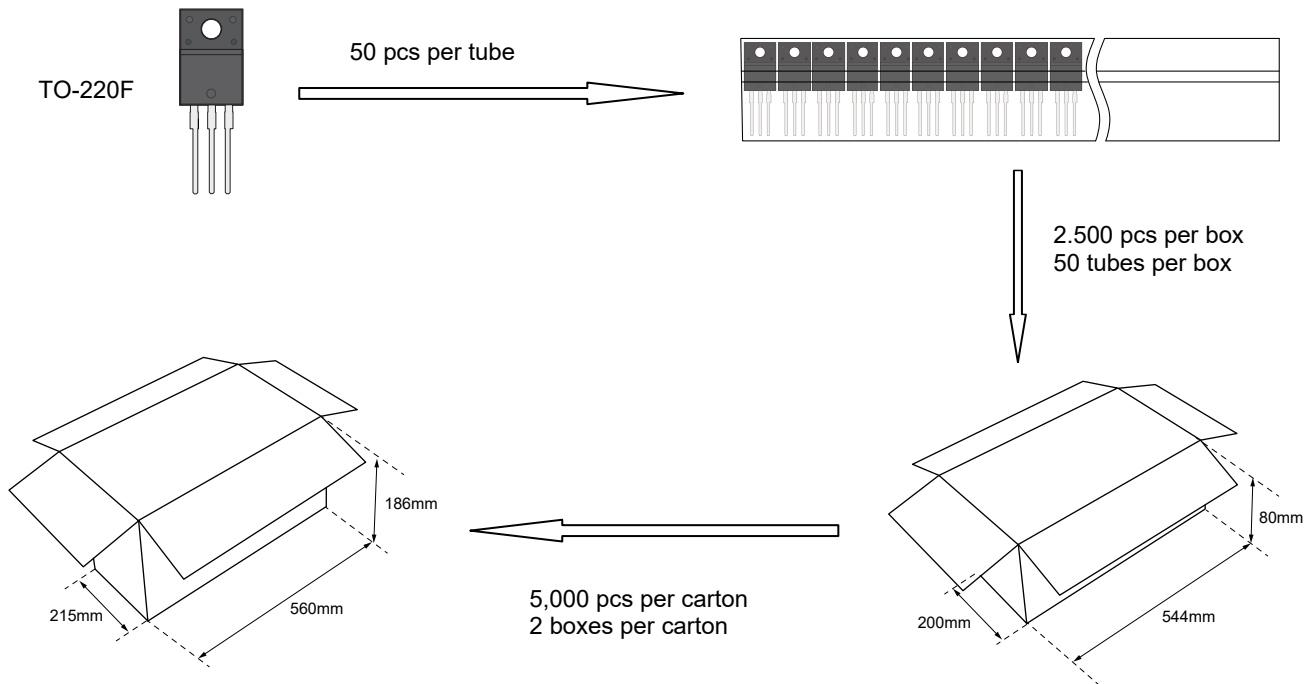
- Temperature: 360°C
- Time: 3s max.
- Times: one time

◆ Storage conditions

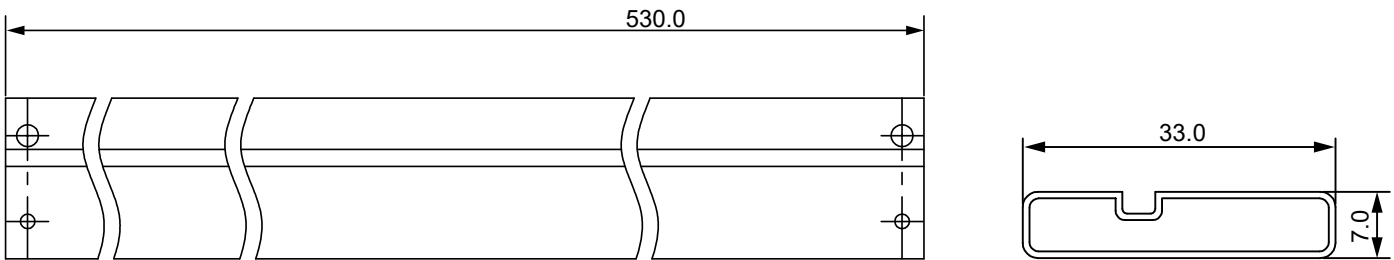
- **Temperature**
5 to 40°C
- **Humidity**
30 to 80% RH
- **Recommended period**
One year after manufacturing

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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The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. TANI shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and TANI assumes no responsibility for the application of the product. TANI strives to provide accurate and up-to-date information to the best of our ability. However, due to technical, human, or other reasons, TANI cannot guarantee that the information provided in the product specification is entirely accurate and error-free. TANI shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications.

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Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.

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