

### Product Summary

- $V_{DS} = 600V, I_D = 02A$
- $R_{DS(on)} < 4.5\Omega @ V_{GS} = 10V$

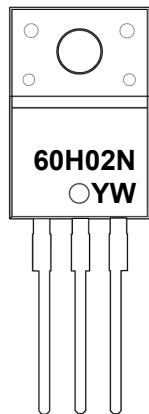
### Features

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

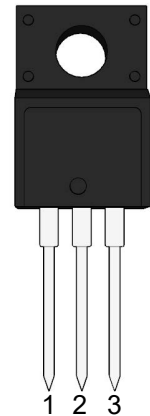
### Application

- High Efficiency Switch Mode Power Supplies
- Electronic Lamp Ballasts Based on Half Bridge
- LED Power Supplies

### Marking Code



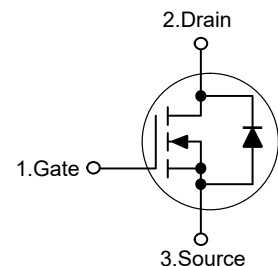
### TO-220F



### (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	$V_{DS}$	600	V
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Drain Current-Continuous	$I_D$	2	A
Drain Current-Pulsed <sup>Note1</sup>	$I_{DM}$	8	A
Maximum Power Dissipation	$P_D$	41	W
Single Pulse Avalanche Energy <sup>Note2</sup>	$E_{AS}$	320	mJ
Junction Temperature	$T_J$	150	°C
Storage Temperature Range	$T_{STG}$	-55 to +150	°C

### Thermal Characteristics

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.5	°C/W
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## Electrical Characteristics

(T<sub>J</sub>=25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	600	650	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
Gate-Body Leakage	$I_{GSS}$	$V_{DS}=0V, V_{GS}=30V$	-	0.8	100	nA
		$V_{DS}=0V, V_{GS}=-30V$	-	-4	-100	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=600V, V_{GS}=0V$	-	0.8	20	uA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=1A$	-	3.8	4.5	$\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=15V, I_D=1A$	-	2	10	S
Drain-Source Diode Forward Continuous Current	$I_S$	$V_{GS}=0V$	-	-	2	A
Source-drain (diode forward) voltage	$V_{SD}$	$V_{GS}=0V, I_S=2A$		0.85	1.4	V
Dynamic Characteristics						
Input Capacitance	$C_{iss}$	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1MHz$	-	347	-	pF
Output Capacitance	$C_{oss}$		-	61	-	
Reverse Transfer Capacitance	$C_{rss}$		-	16	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=300V,$ $R_G=10\Omega$ $V_{GS}=10V,$ $I_D=2A$	-	19.4	-	ns
Rise Time	$t_r$		-	7.74	-	
Turn-Off Delay Time	$t_{d(off)}$		-	28.7	-	
Fall-Time	$t_f$		-	9.3	-	
Total Gate Charge	$Q_g$	$V_{DS}=300V,$ $V_{GS}=10V,$ $I_D=2A$		7.84	-	nC
Gate-Source Charge	$Q_{gs}$		-	1.91	-	
Gate-Drain Charge	$Q_{gd}$		-	3	-	

1、Repetitive rating, pulse width limited by junction temperature.

2、Pulse width &lt;300us , duty cycle &lt;2%.

3、I<sub>SD</sub>=2.0A di/dt≤100A/us, V<sub>DD</sub>≤BV<sub>DSS</sub>, T<sub>J</sub>≤150°C.4、L=2.2mH, V<sub>DD</sub>=50V, I<sub>D</sub>=2.0A, R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C.

Typical Characteristic Curves

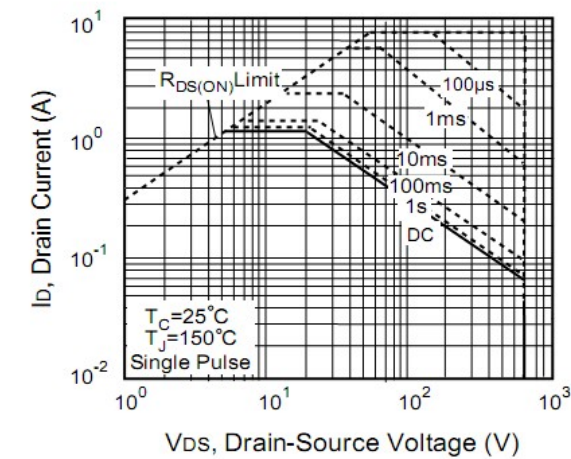


Figure 1 Maximum Safe Operating Area

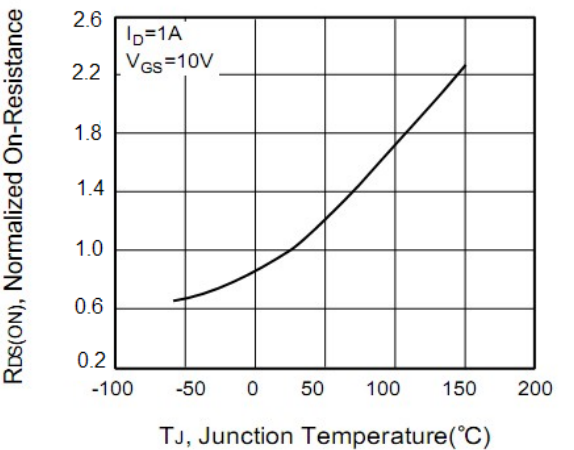


Figure 2. Normalized On-Resistance Variation with Temperature

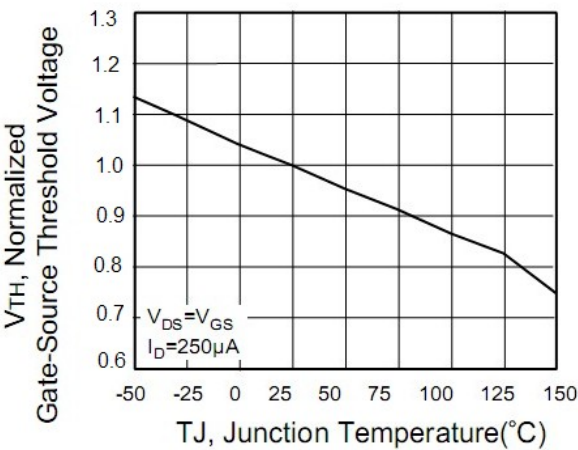


Figure 3. Gate Threshold Variation with Temperature

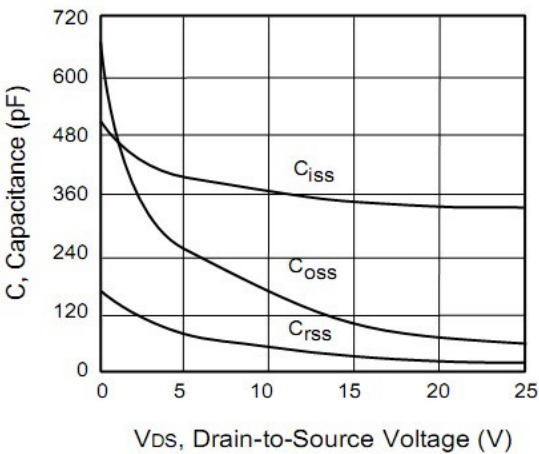


Figure 4. Capacitance Characteristics

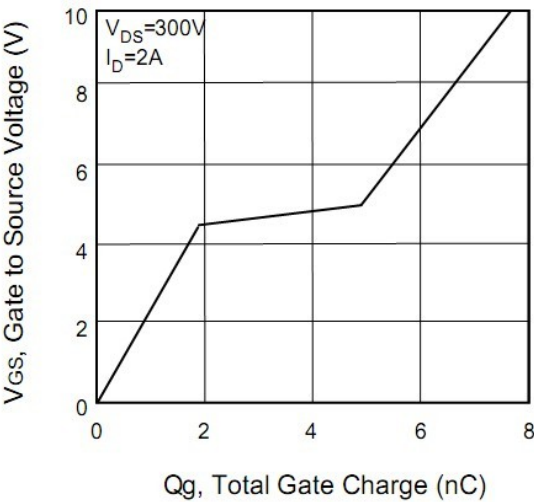


Figure 5. Gate Charge Characteristics

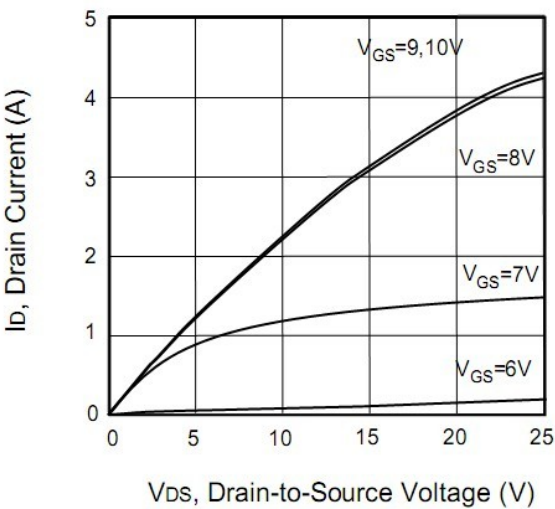


Figure 6. On-State Characteristics

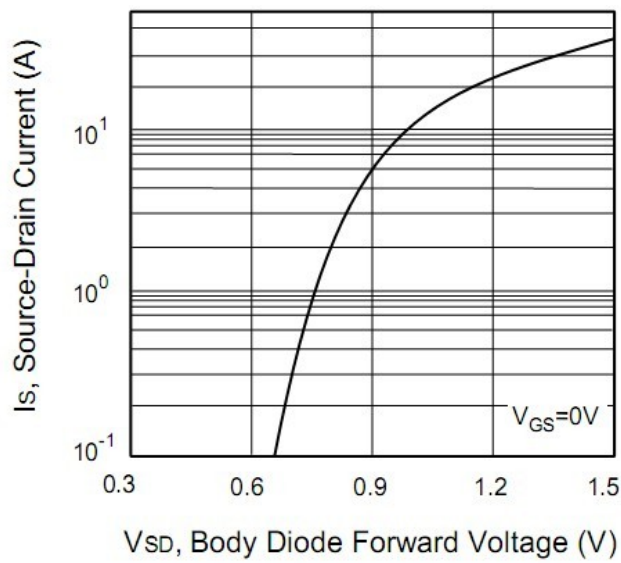


Figure 7. Body Diode Forward Voltage Variation with Source Current

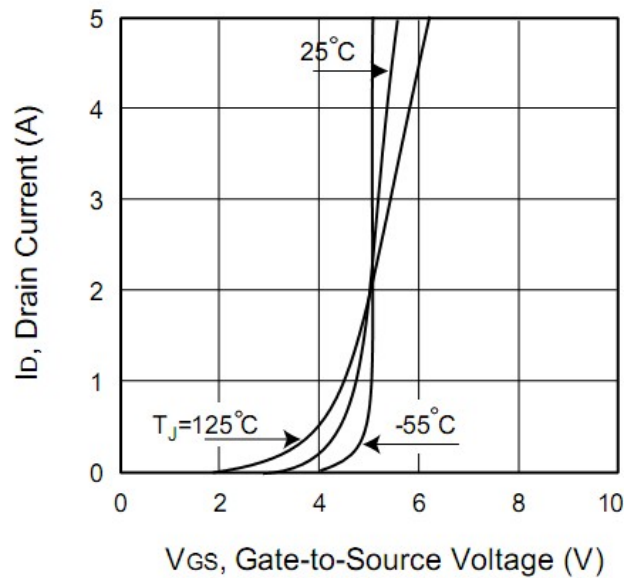


Figure 8. Transfer Characteristics

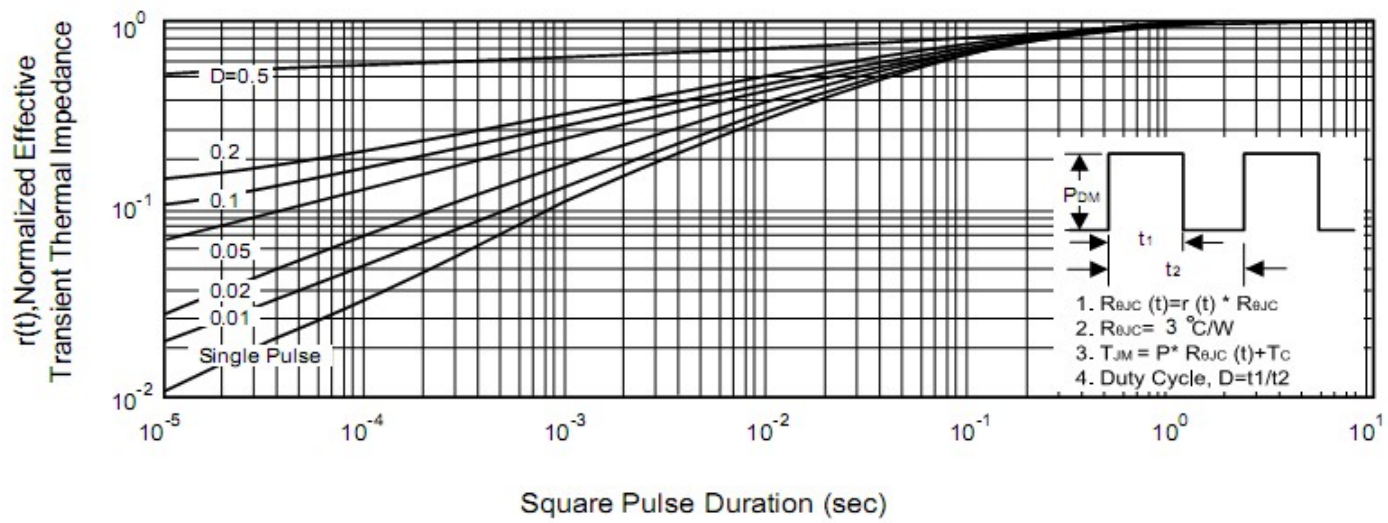
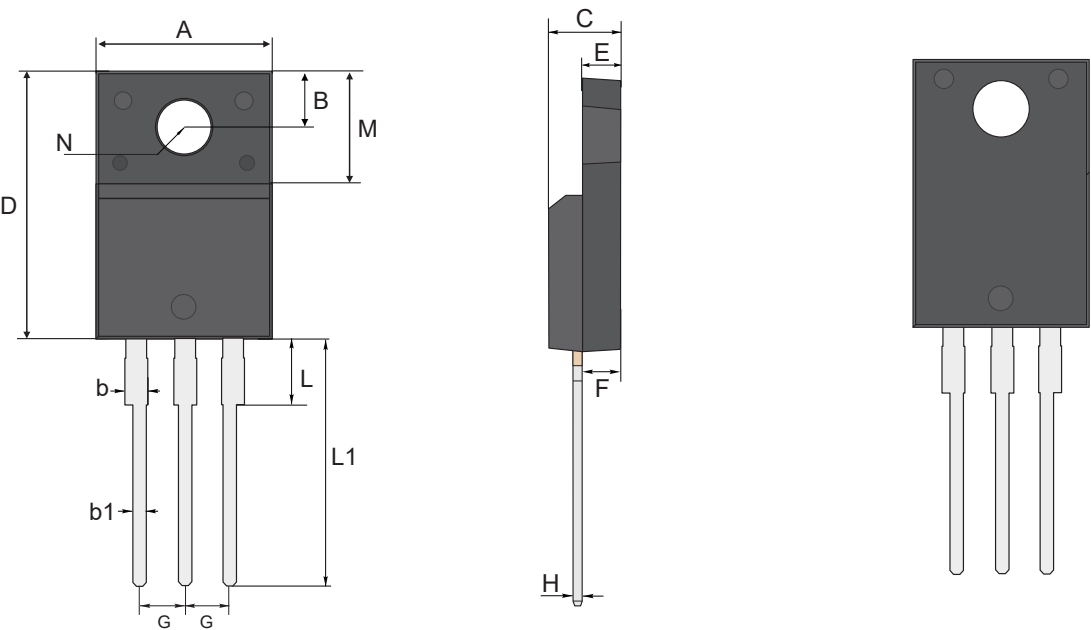


Figure 9 Normalized Effective Transient Thermal Impedance With Pulse Duration

Package Outline

TO-220F

Dimensions in mm



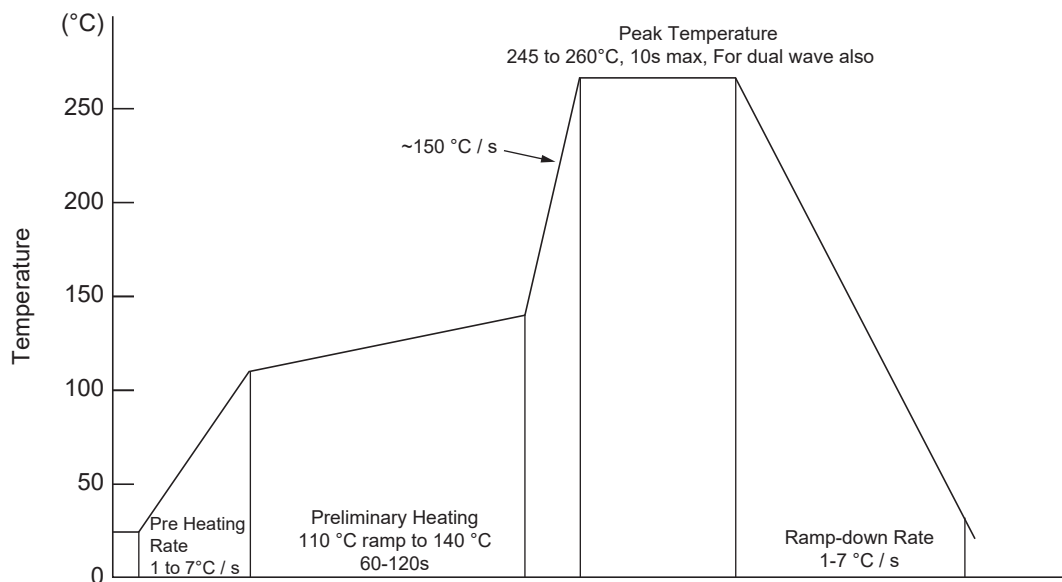
UNIT		A	B	b	b1	C	D	E	F	G	H	L	L1	M	N
mm	max	10.28	3.37	1.44	0.9	4.9	16.07	2.74	2.74	2.64	0.6	2.85	13.7	6.88	3.18 typ.
	typ	10.18	3.27	1.34	0.8	4.7	15.87	2.54	2.54	2.54	0.5	2.65	13.5	6.68	
	min	10.08	3.17	1.24	0.7	4.5	15.67	2.34	2.34	2.44	0.4	2.45	13.3	6.48	
mil	max	405	133	57	35	193	633	108	108	104	24	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
TN60H02NTF	TO-220F	50PCS/Tube

## Conditions of Soldering and Storage

### ◆ Wave Soldering



### ◆ Conditions of hand soldering

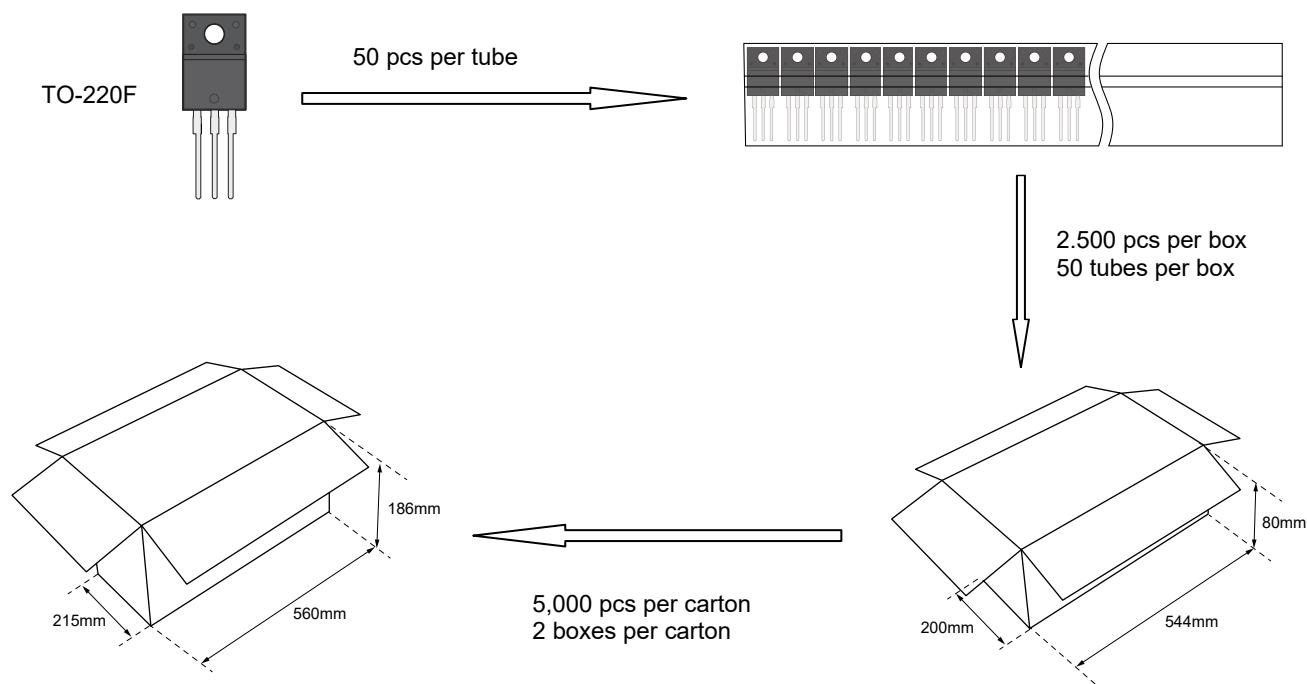
- Temperature: 360°C
- Time: 3s max.
- Times: one time

### ◆ Storage conditions

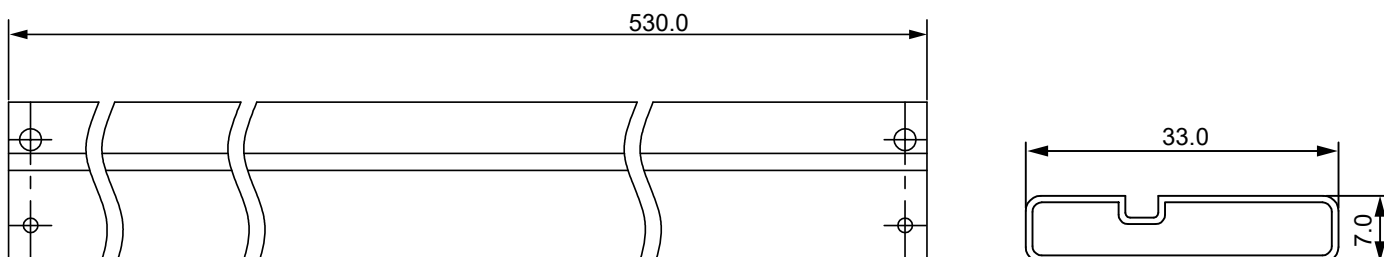
- **Temperature**  
5 to 40°C
- **Humidity**  
30 to 80% RH
- **Recommended period**  
One year after manufacturing

## Package Specifications

- The method of packaging



## ◆ Tube data



## Contact Information

TANI website: <http://www.tanisemi.com> Email: [tani@tanisemi.com](mailto:tani@tanisemi.com)

For additional information, please contact your local Sales Representative.



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