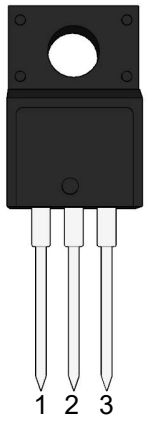
TN60H05NTF

N-Channel Enhancement Mode Power MOSFET

Product Summary

- V_{DS}= 600V,I_D= 05A
- $R_{DS(on)}$< 1.8Ω @V_{GS}= 10V

TO-220F



(Top View)

Pin	Description
1	Gate
2	Drain
3	Source

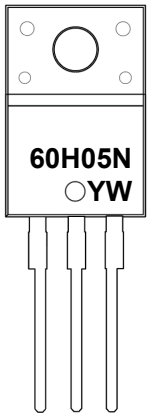
Features

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

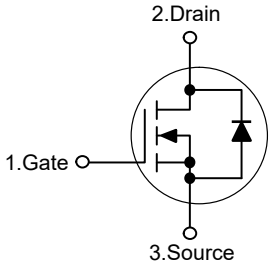
Application

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

Marking Code



Schematic Diagram



Absolute Maximum Ratings

Ratings at 25℃ case temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	600	V
Gate-Source Voltage	V_{GS}	±30	V
Drain Current-Continuous	I_D	5	A
Drain Current-Pulsed Note1	I_{DM}	20	A
Maximum Power Dissipation	P_D	110	W
Single Pulse Avalanche Energy Note2	E_{AS}	247	mJ
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	1.39	°C/W

Electrical Characteristics

(T_J=25℃ unless o therwise s pecified)

Characteristics	Symbol	Test conditions	Min	Typ	Max	Unit
Drain -Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA	600	--	--	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=600V,V_{GS}=0V	--	--	10	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±30V,V_{DS}=0V	--	--	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}= V_{DS},I_D=250μA	2.0	--	4.0	V
Static Drain- Source On State Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=2.5A	--	1.8	2.15	Ω
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V,f=1.0MHz	--	463	--	pF
Output Capacitance	C_{oss}		--	58	--	
Reverse Transfer Capacitance	C_{rss}		--	5.0	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=300V,I_D=5.0A,R_G=24Ω （Note2, 3）	--	13	--	ns
Turn-on Rise Time	t_r		--	31	--	
Turn-off Delay Time	$t_{d(off)}$		--	42	--	
Turn-off Fall Time	t_f		--	33	--	
Total Gate Charge	Q_g	V_{DS}=480V，I_D=5.0A，V_{GS}=10V （Note2, 3）	--	13	--	nC
Gate-Source Charge	Q_{gs}		--	2.9	--	
Gate-Drain Charge	Q_{gd}		--	6.7	--	

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min	Typ	Max	Unit
Continuous Source Current	I_S	Integral Reverse P-N Junction Diode in the MOSFET	--	--	5	A
Pulsed Source Current	I_{SM}		--	--	20	
Diode Forward Voltage	V_{SD}	I_S=5.0A, V_{GS}=0V	--	--	1.4	V
Reverse Recovery Time	T_{rr}	I_S=5.0A, V_{GS}=0V, dI_F/dt=100A/μs （Note2）	--	450	--	ns
Reverse Recovery Charge	Q_{rr}		--	2.2	--	μC

Notes:

1. L=30mH, I_{AS}=3.8A, V_{GS}=100V, R_G=25Ω, starting TB_{JB}=25°C;
2. Pulse Test: Pulse width ≤300μs,Duty cycle≤2%;
3. Essentially independent of operating temperature.

Typical Characteristic Curves

Figure 1. On-Region Characteristics

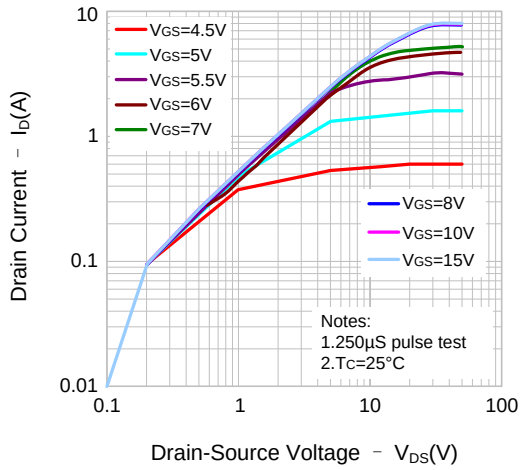


Figure 2. Transfer Characteristics

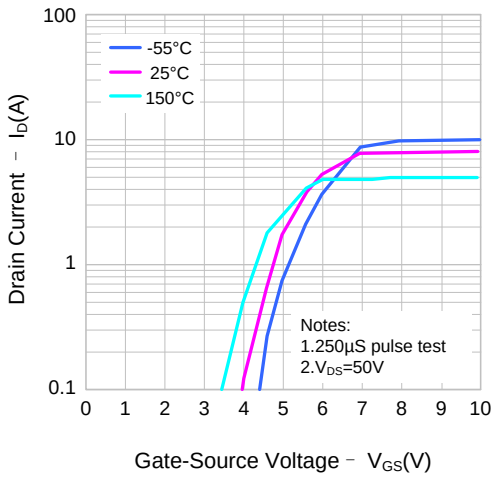


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

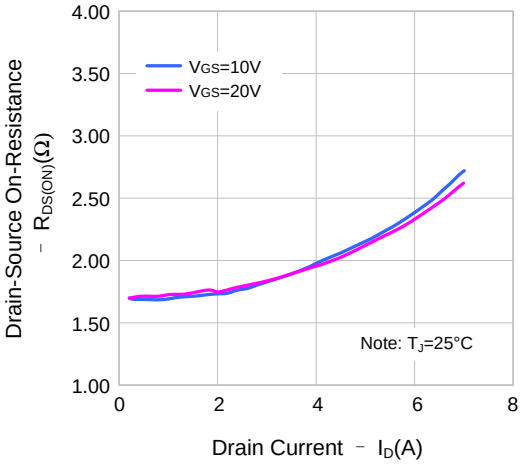


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

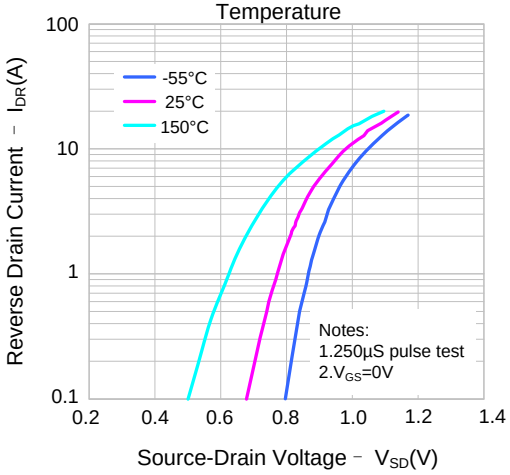


Figure 5. Capacitance Characteristics

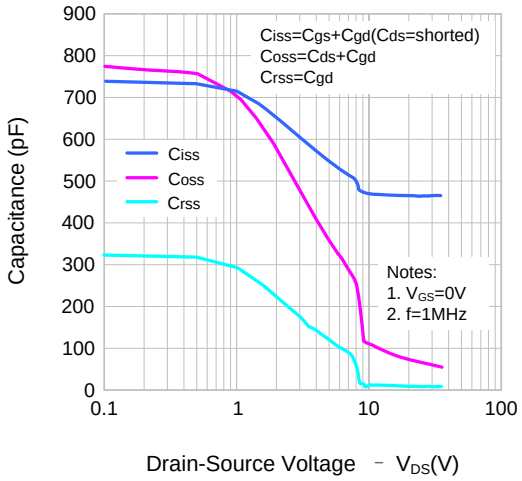


Figure 6. Gate Charge Characteristic

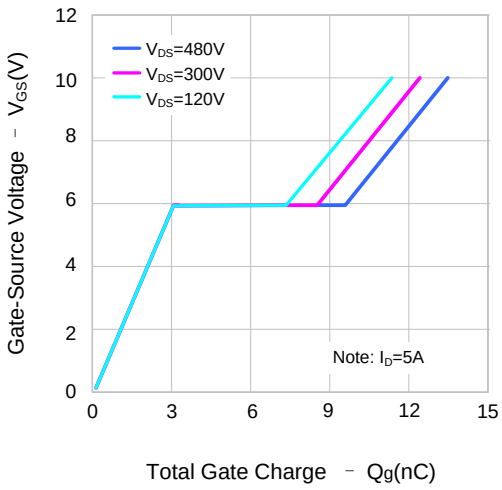


Figure 7. Breakdown Voltage Variation vs. Temperature

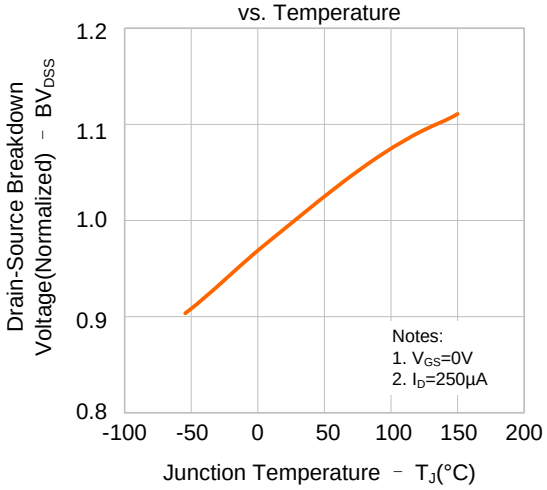


Figure 8. On-resistance Variation vs. Temperature

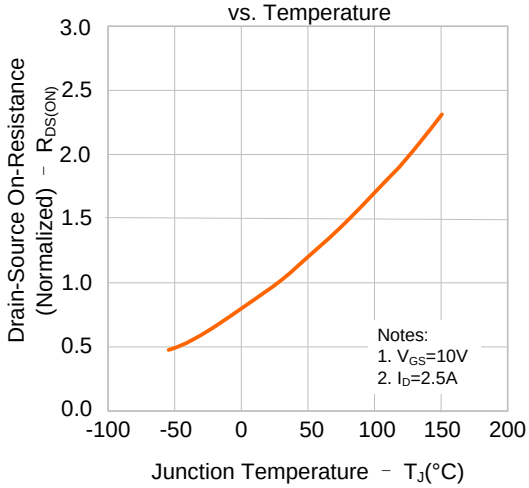


Figure 9-1. Max. Safe Operating Area (SVF5N60F)

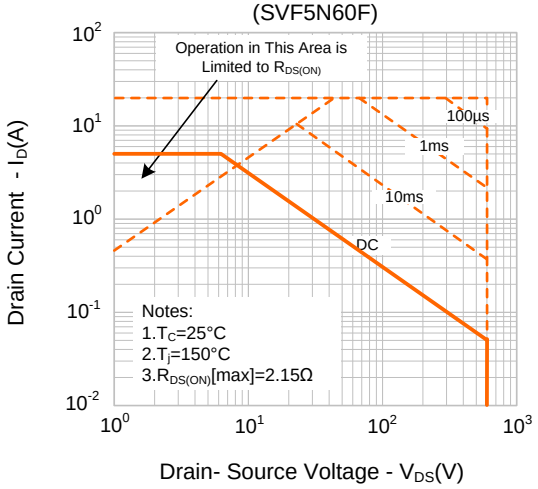


Figure 9-2. Max. Safe Operating Area (SVF5N60D)

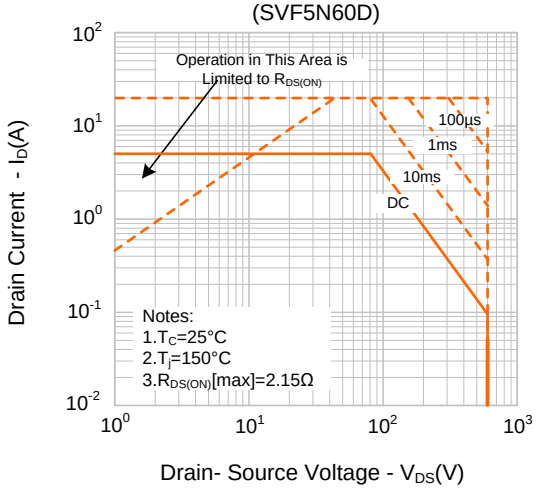


Figure 9-3. Max. Safe Operating Area(SVF5N60K)

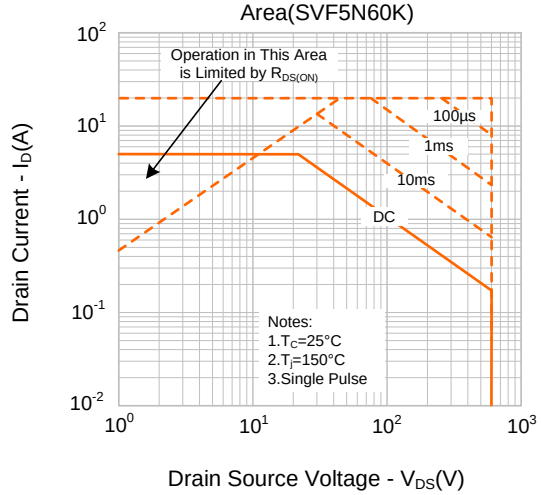
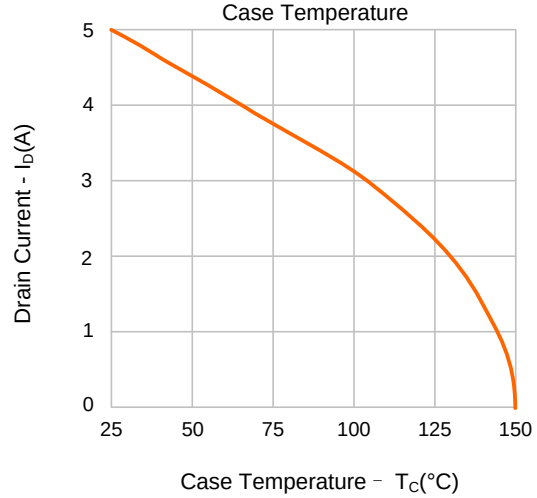


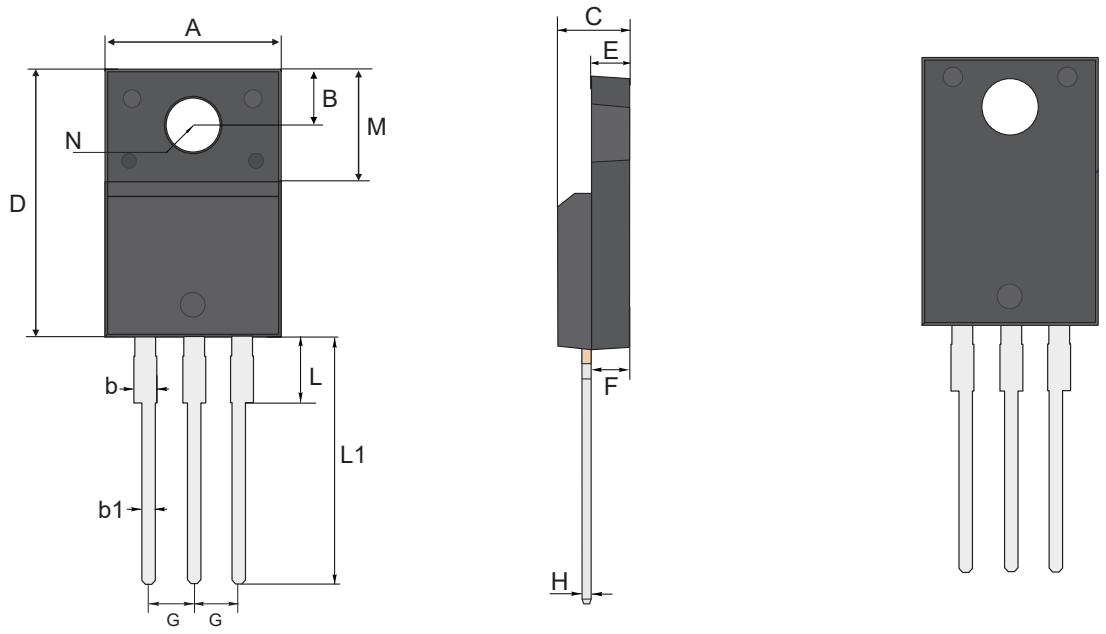
Figure 10. Maximum Drain Current vs. Case Temperature



Package Outline

TO-220F

Dimensions in mm



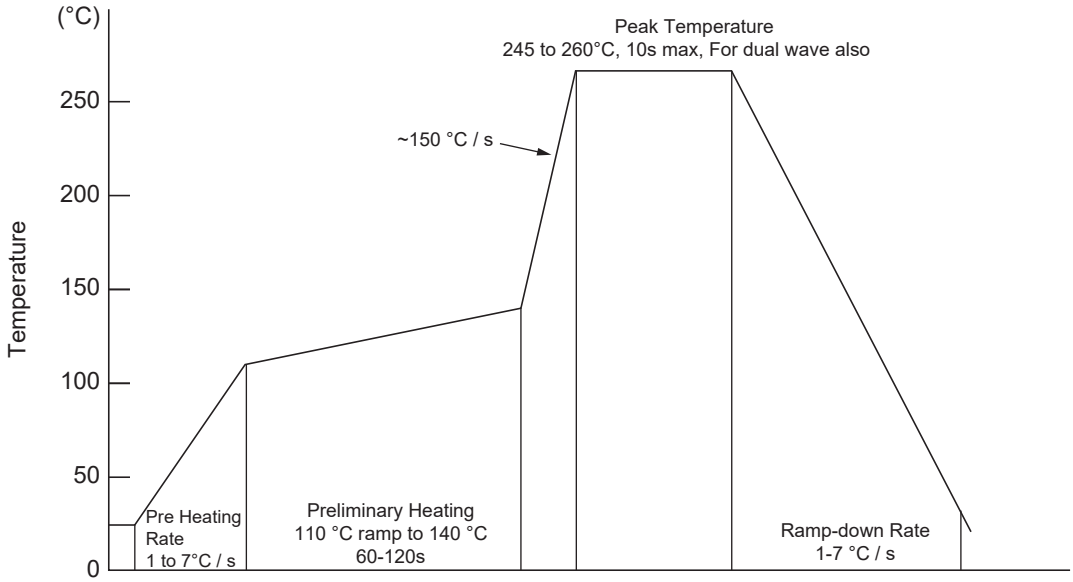
UNIT		A	B	b	b1	C	D	E	F	G	H	L	L1	M	N
mm	max	10.28	3.37	1.44	0.9	4.9	16.07	2.74	2.74	2.64	0.6	2.85	13.7	6.88	3.18 typ.
	typ	10.18	3.27	1.34	0.8	4.7	15.87	2.54	2.54	2.54	0.5	2.65	13.5	6.68	
	min	10.08	3.17	1.24	0.7	4.5	15.67	2.34	2.34	2.44	0.4	2.45	13.3	6.48	
mil	max	405	133	57	35	193	633	108	108	104	24	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
TN60H05NTF	TO-220F	50PCS/Tube

Conditions of Soldering and Storage

◆ Wave Soldering



◆ Conditions of hand soldering

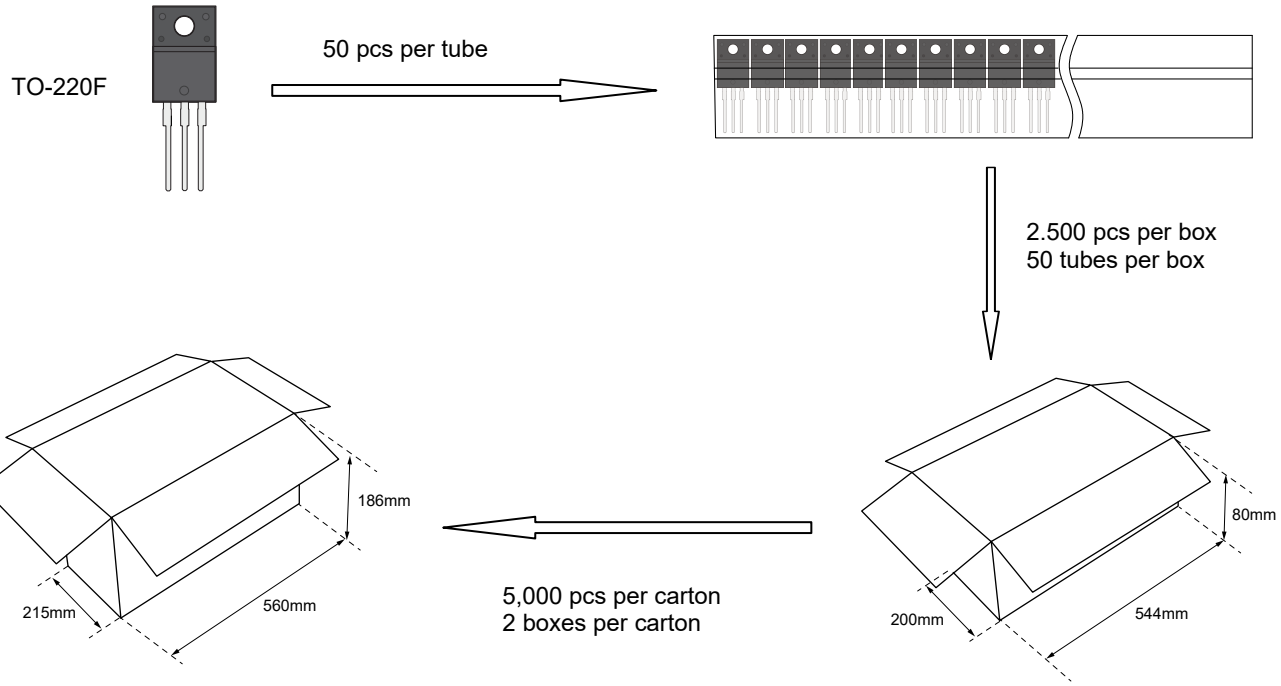
- Temperature: 360°C
- Time: 3s max.
- Times: one time

◆ Storage conditions

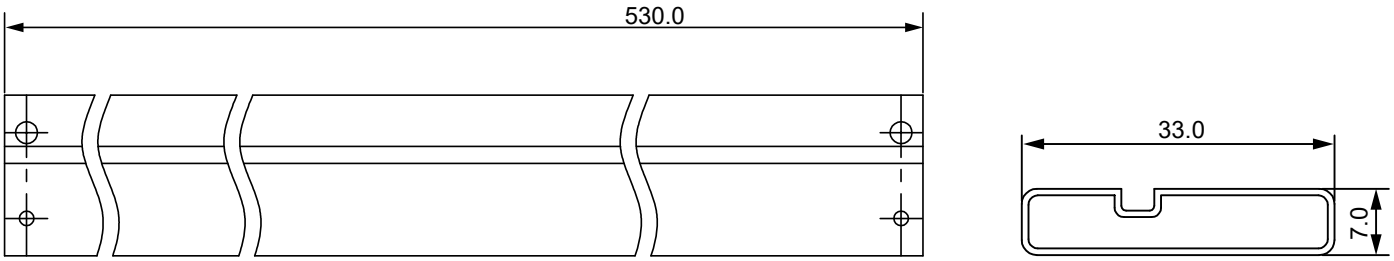
- **Temperature**
  5 to 40°C
- **Humidity**
  30 to 80% RH
- **Recommended period**
  One year after manufacturing

Package Specifications

- The method of packaging



- **Tube data**



Contact Information

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For additional information, please contact your local Sales Representative.

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