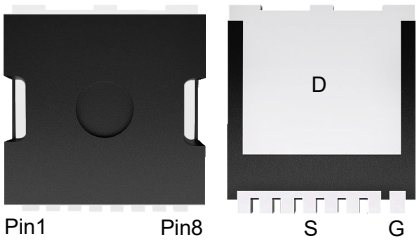
TNG15H180NTL

N-Channel Enhancement Mode Power MOSFET

Product Summary

- V_{DS}= 150V,I_D= 180A
- $R_{DS(on)}$< 5.7mΩ @V_{GS}= 10V

TOLL

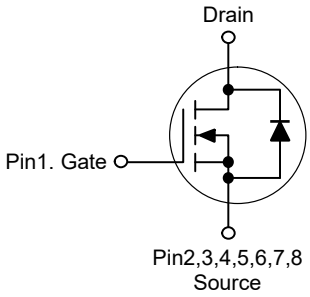


(Top View) (Bottom View)

Features

- Advanced Split Gate Trench Technology
- RoHS Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 1
- 100% Avalanche Tested
- 100% DVDS

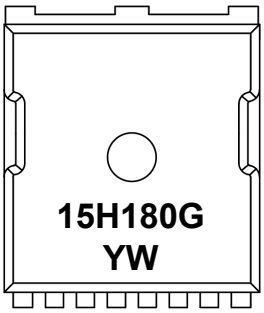
Schematic Diagram



Application

- Switching Application
- Power Management for Inverter Systems
- Battery Management

Marking Code



(Top View)

Absolute Maximum Ratings

Ratings at 25℃ case temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	180	A
Drain Current-Pulsed Note1	I_{DM}	720	A
Maximum Power Dissipation	P_D	302	W
Single Pulse Avalanche Energy Note2	E_{AS}	968	mJ
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +175	°C

Thermal Characteristics

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.50	°C/W

Electrical Characteristics

(T_J=25℃ unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	150	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	VDS=150V,VGS=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	VGS=±20V,VDS=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	VDS=VGS,ID=250μA	2.0	2.9	4.0	V
g_{FS}	Forward Transconductance	VDS=5V,ID=10A	--	80	--	S
$R_{DS(on)}$	Drain-Source On-State Resistance	VGS=10V, ID=20A	--	5.6	6.3	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	VDS=40V,VGS=0V ,F=1MHZ	--	5240	--	pF
C_{oss}	Output Capacitance		--	412	--	pF
C_{rss}	Reverse Transfer Capacitance		--	10	--	pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz	--	2.4	--	Ω
Switching Times						
$t_{d(on)}$	Turn-on Delay Time	VGS=10V,VDS=75V, ID=100A,RGEN=1.6Ω	--	22	--	nS
tr	Turn-on Rise Time		--	115	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	44	--	nS
tf	Turn-Off Fall Time		--	105	--	nS
Qg	Total Gate Charge	VGS=10V, VDS=75V, ID=20A	--	72	--	nC
Qgs	Gate-Source Charge		--	18	--	nC
Qgd	Gate-Drain Charge		--	10	--	nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current(Body Diode)		--	--	180	A
V_{SD}	Forward on Voltage	VGS=0V,IS=20A	--	0.75	1.2	V
trr	Reverse Recovery Time	VR=75V,IF=20A , dI/dt=100A/μs , TJ=25℃	--	45	--	ns
Qrr	Reverse Recovery Charge		--	12	--	nc

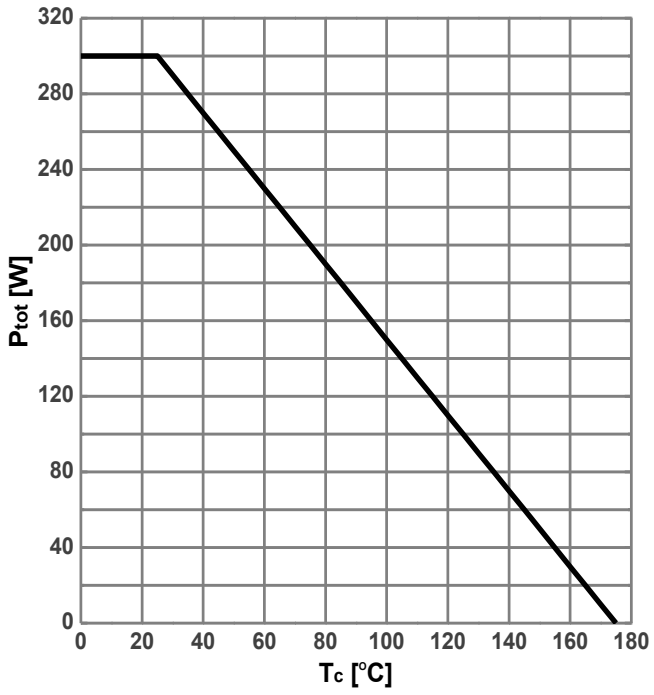
Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature

Notes 3.EAS condition: TJ=25℃,VDD=50V,Vgs=10V,ID=44A, L=1mH,RG=25ohm

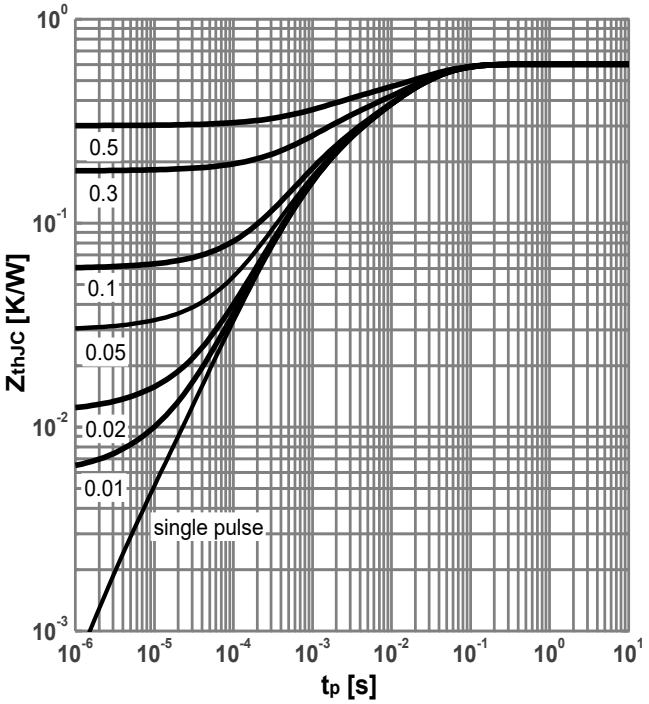
Typical Characteristic Curves

Diagram 1: Power dissipation



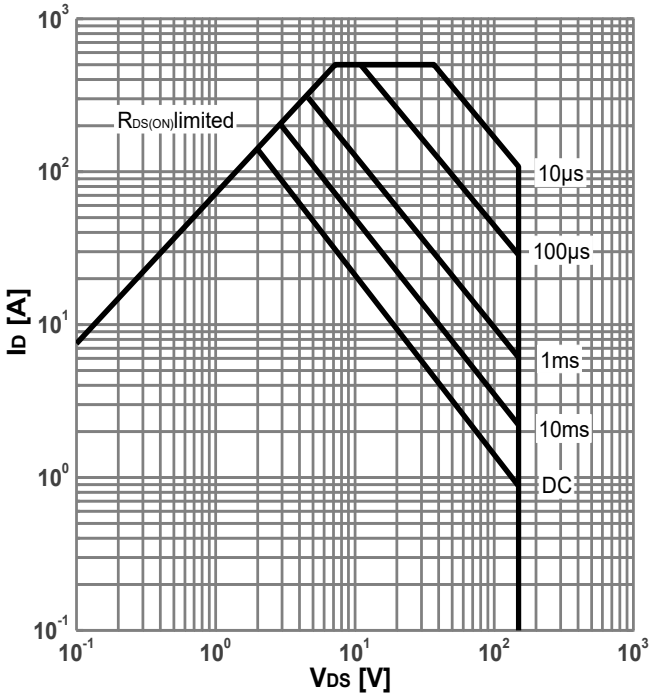
P_{tot}=f(T_C)

Diagram 2: Max. transient thermal impedance



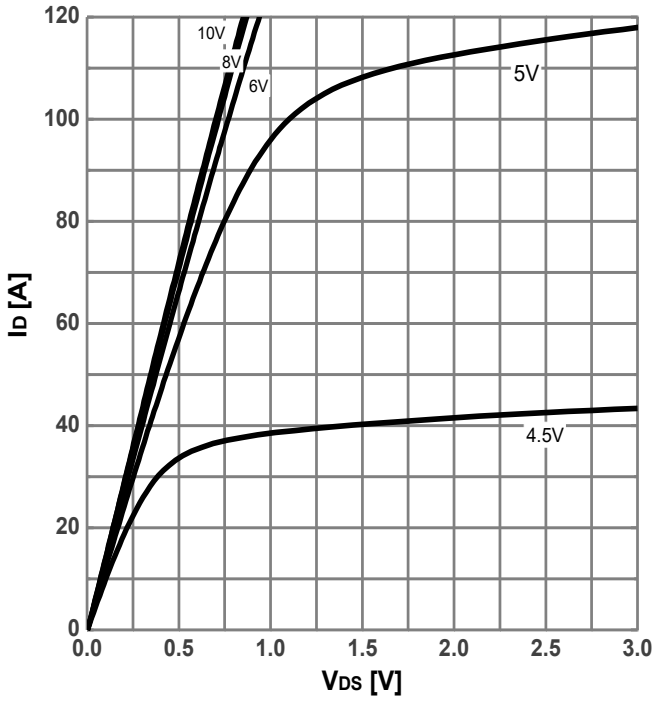
Z_{thJC}=f(t_p); parameter: D= t_p/T

Diagram 3: Safe operating area



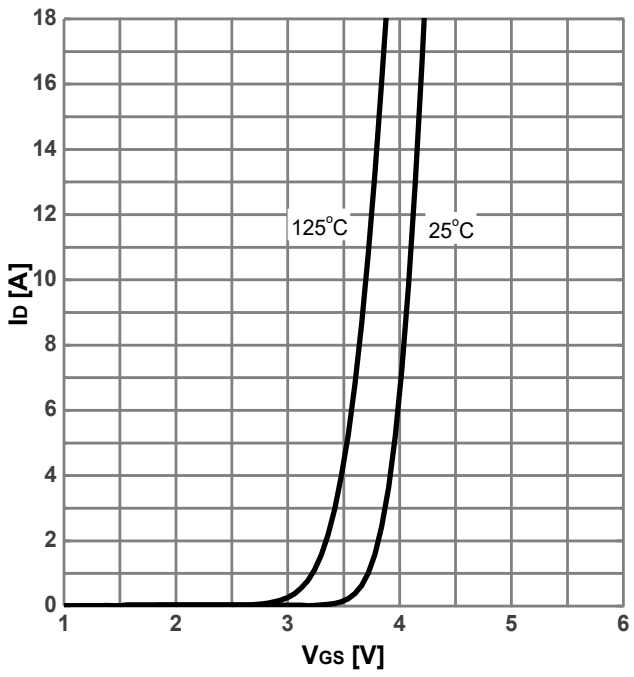
I_D=f(V_{DS}); Tj=25°C; D=0; parameter: t_p

Diagram 4: Typ. output characteristics



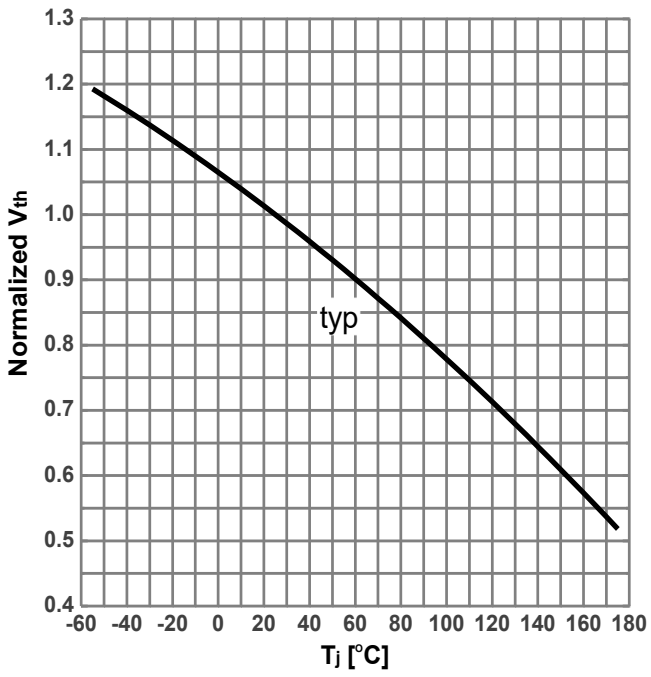
I_D=f(V_{DS}); Tj=25°C; parameter: V_{GS}

Diagram 5: Typ. transfer characteristics



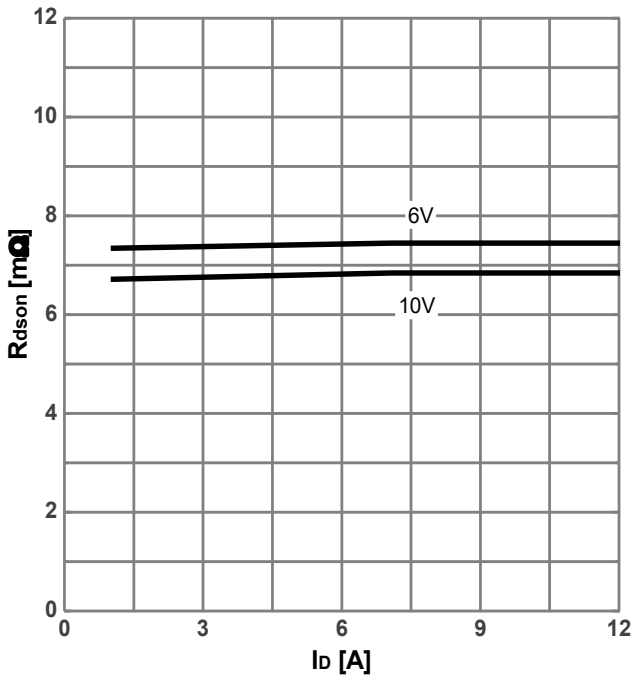
I_D=f(V_{GS}); V_{DS}=5V; parameter: T_j

Diagram 6: Gate threshold voltage vs. Junction temperature



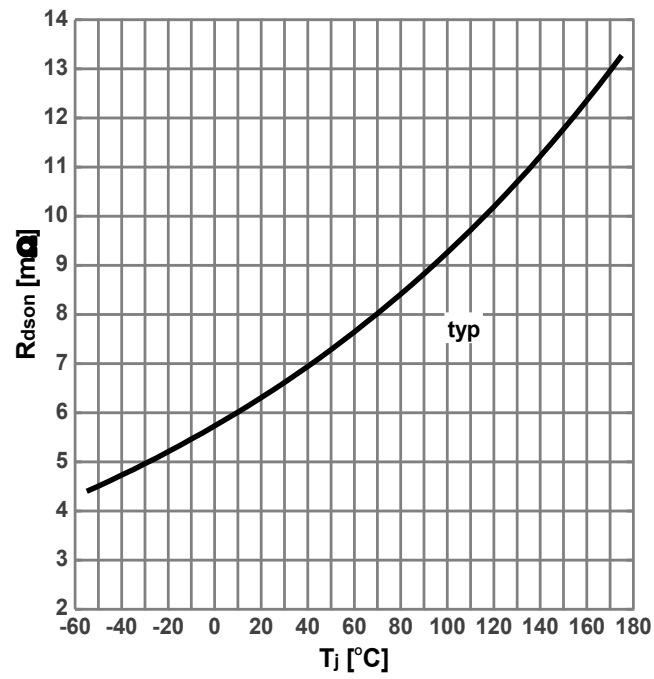
V_{th}=f(T_j); I_D=250µA

Diagram 7: On-state resistance vs. Drain current



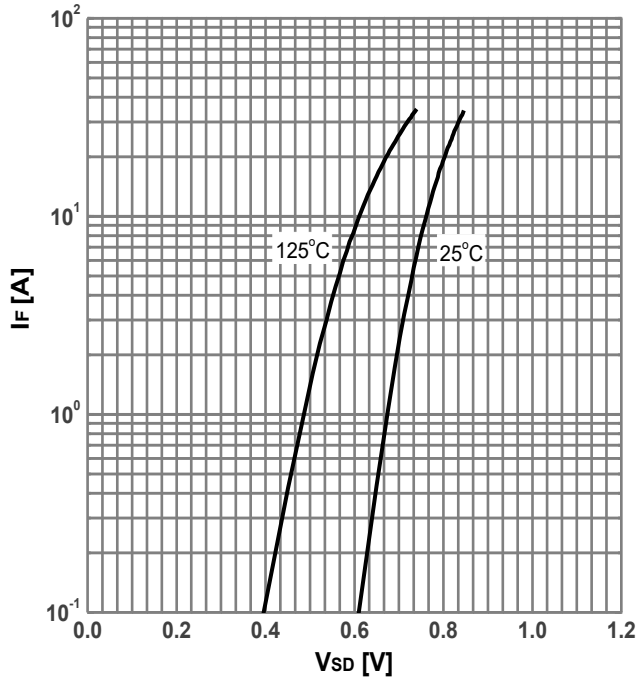
R_{DS}(on)=f(I_D); Tj=25°C; parameter: V_{GS}

Diagram 8: On-state resistance vs. Junction temperature



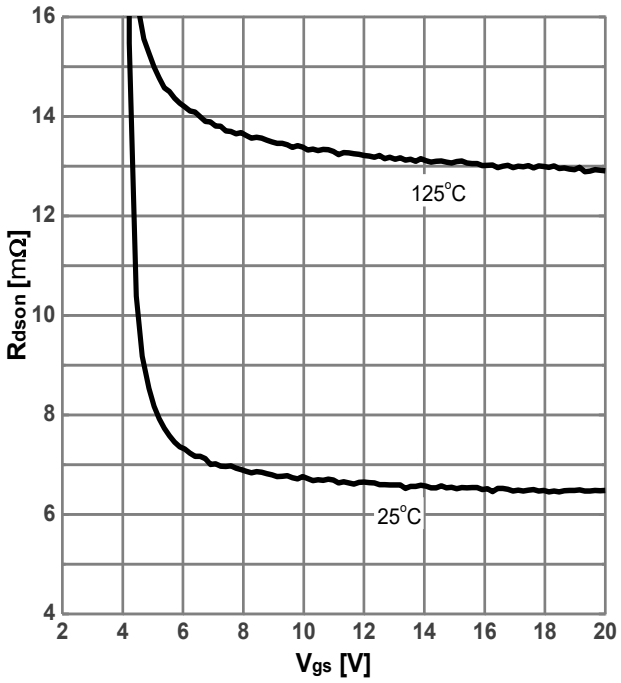
R_{DS}(on)=f(T_j); I_D=20A; V_{GS}=10V

Diagram 9: Forward characteristics of reverse diode



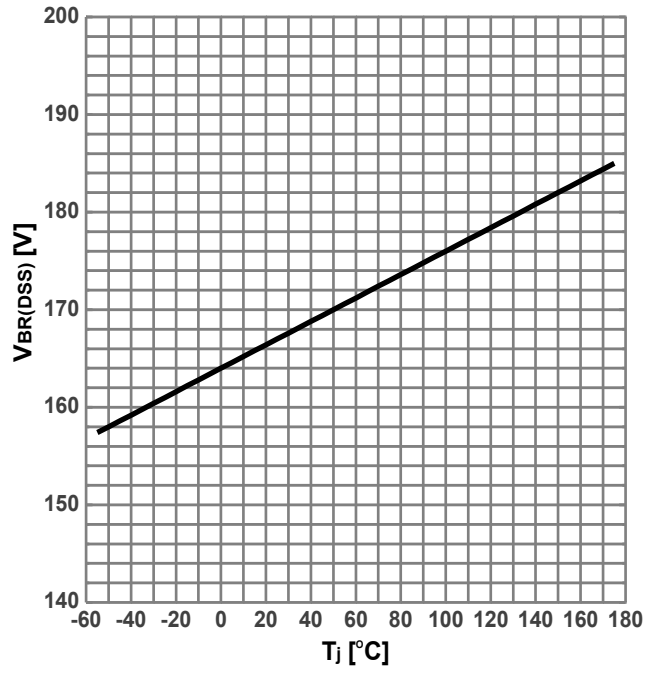
I_F=f(V_{SD}); parameter: T_j

Diagram 10: On-state resistance vs. Vgs characteristics



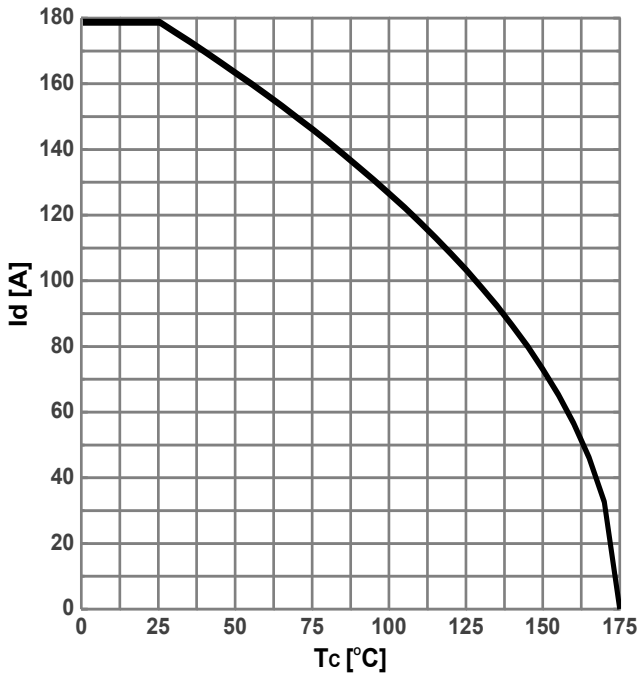
R_{DS}(on)=f(V_{gs}); I_D=20A; parameter: T_j

Diagram 11: Breakdown Voltage Variation vs. Temperature



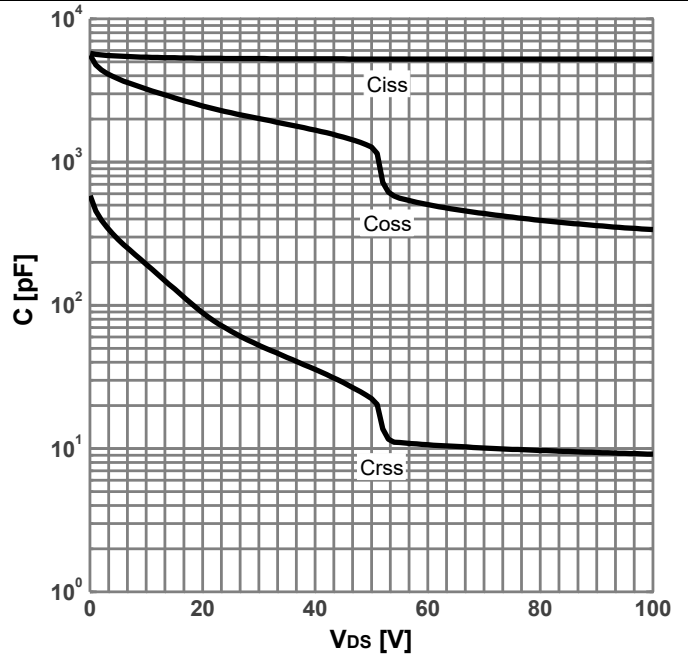
$V_{BR(DSS)}$=f(T_j); I_D=250μA

Diagram 12: Maximum Drain Current



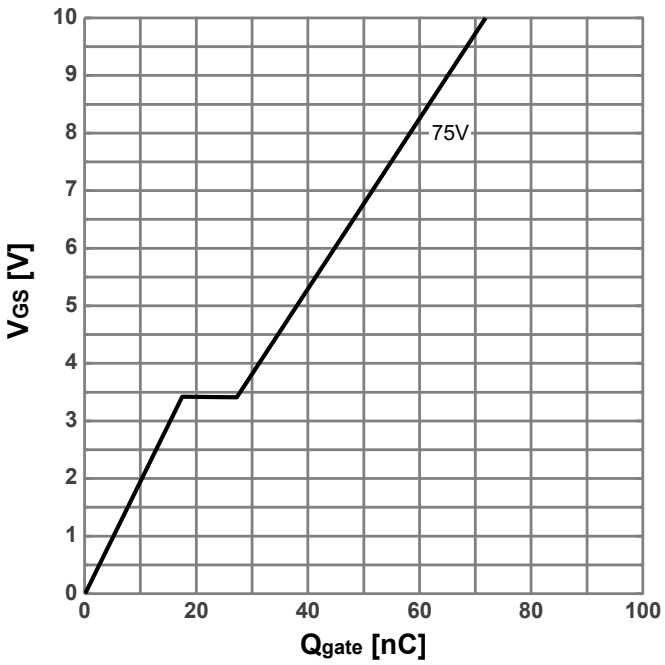
I_D= f(T_C); V_{GS}=10V

Diagram 13: Typ. capacitances



C=f(V_{DS}); V_{GS}=0V; f=1MHz

Diagram 14: Typ. gate charge

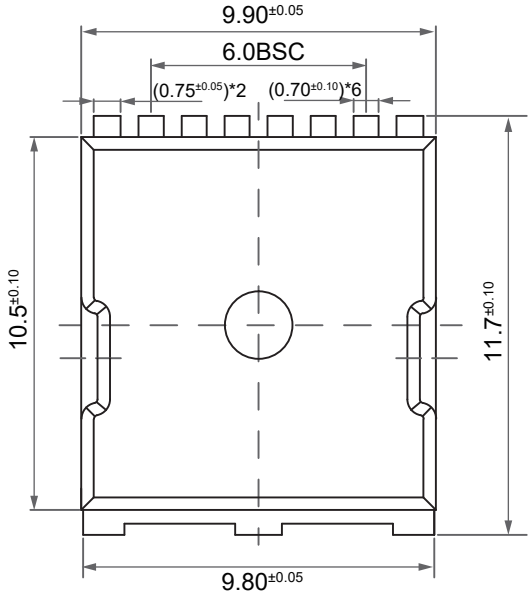


V_{GS}=f(Q_{gate}); I_D=20A pulsed; V_{DS}=75V

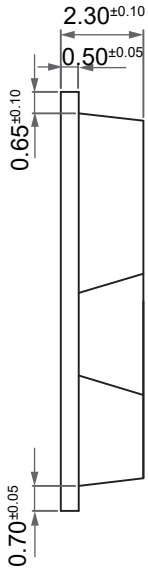
Package Outline

TOLL

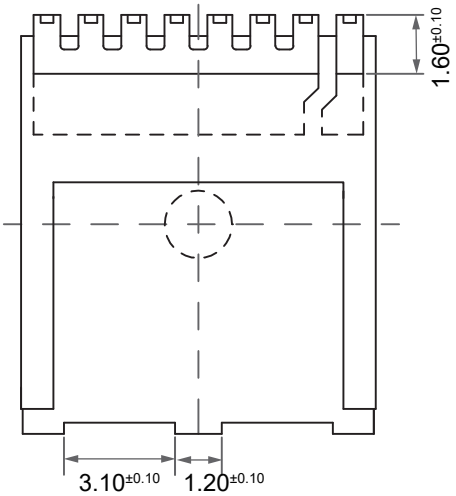
Dimensions in mm



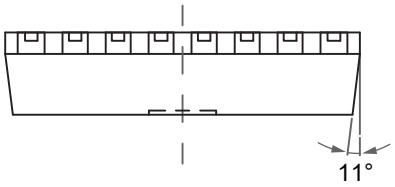
TOP VIEW



SIDE VIEW



BOTTOM VIEW



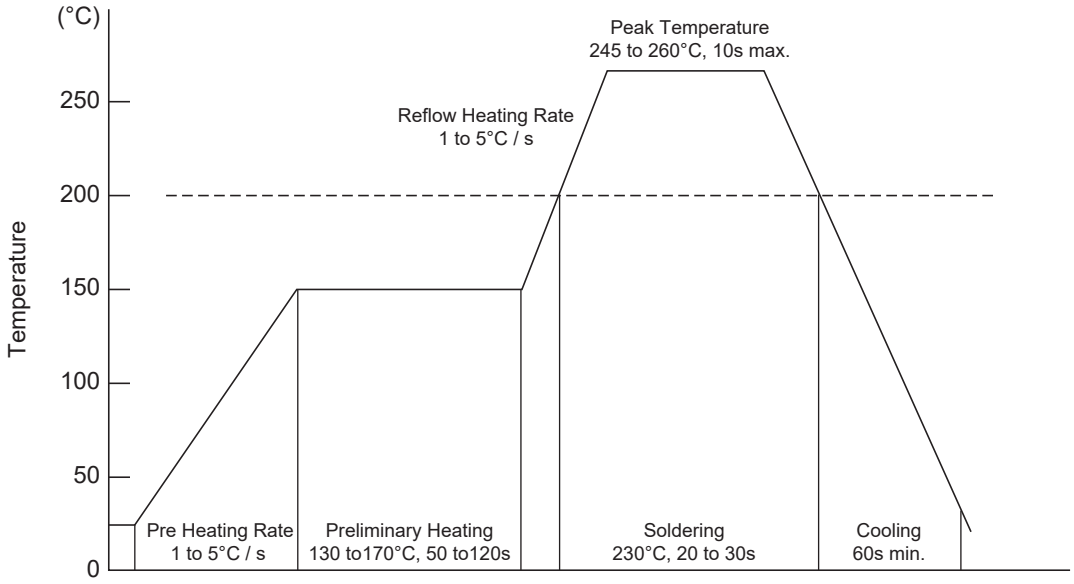
FRONT VIEW

Ordering Information

Device	Package	Shipping
TNG15H180NTL	TOLL	2,000PCS/Reel&13inches

Conditions of Soldering and Storage

◆ Recommended condition of reflow soldering



Recommended peak temperature is over 245°C. If peak temperature is below 245°C, you may adjust the following parameters:

- Time length of peak temperature (longer)
- Time length of soldering (longer)
- Thickness of solder paste (thicker)

◆ Conditions of hand soldering

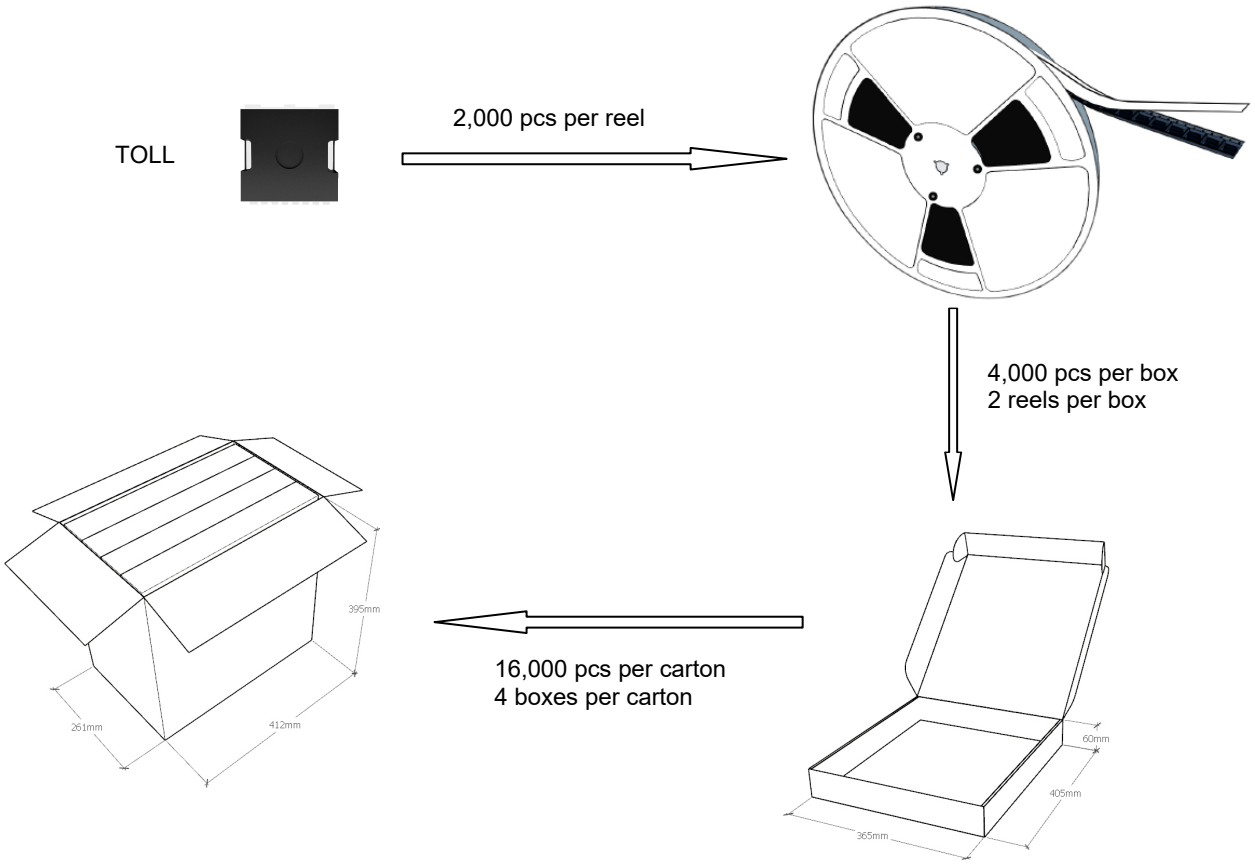
- Temperature: 300°C
- Time: 3s max.
- Times: one time

◆ Storage conditions

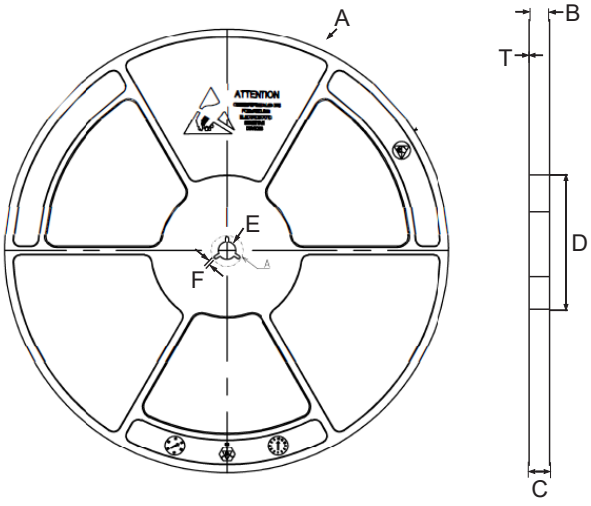
- **Temperature**
  5 to 40°C
- **Humidity**
  30 to 80% RH
- **Recommended period**
  One year after manufacturing

Package Specifications

- The method of packaging



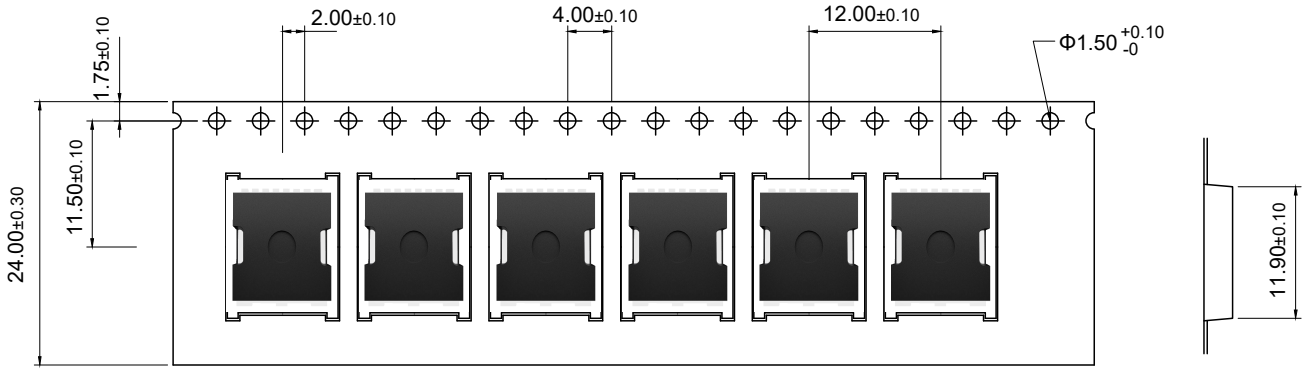
◆ **reel data**



Reel (13")

Symbol	Value(unit:mm)
A	Φ330.2±1
B	25±0.5
C	29.2±2
D	Φ100±0.5
E	Φ13.4±0.2
F	2.3±0.2
T	2.1±0.2

◆ Embossed tape 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

The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

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.

The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. TANI shall assume no responsibility for any consequences resulting from such usage.

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