

1- Electrical Characteristics

➤ **Table 1 Absolute maximum ratings**

Symbol	Parameter		Value	Unit
V_{DSS}	Drain-source voltage		650	V
V_{GSS}	Gate- source voltage		-20V ~ +20V	V
I_D	Drain current (continuous) at $T_C = 25^\circ\text{C}$ operation		22.5	A
	Drain current (continuous) at $T_C = 100^\circ\text{C}$ operation		14.2	A
$I_{D, \text{pulse}}$	Pulsed drain current (pulse width: 10 μs)		84.4	A
P_D	Maximum power dissipation $T_C=25^\circ\text{C}$		104	W
T_C	Operating temperature	Case	-55 to +150	$^\circ\text{C}$
T_J		Junction	-55 to +150	$^\circ\text{C}$
T_S	Storage temperature		-55 to +150	$^\circ\text{C}$
T_{SOLD}	Soldering peak temperature ^b		260	$^\circ\text{C}$
MSL	Moisture sensitivity level		MSL3	

a. In off-state, spike duty cycle $D < 0.01$, spike duration $< 1\mu\text{s}$

b. For 10 sec., 1.6mm from the case

➤ **Table 2 Thermal Characteristics**

Symbol	Parameter	Value	Unit
$R_{\theta JA}$	Thermal resistance junction-ambient	55	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal resistance junction-case	1.20	$^\circ\text{C}/\text{W}$

➤ **Table 3 ESD Rating**

Symbol	Reference	Value	Unit
HBM (G-S) (G-D)	ANSI/ESDA/JEDEC JS-001-2024	2000	V
HBM (D-S)	ANSI/ESDA/JEDEC JS-001-2024	8000	V

➤ **Table 4 Electrical Characteristics** ($T_{CASE} = 25\text{ }^{\circ}\text{C}$ unless otherwise stated)

Symbol	Parameter	Conditions	Values			Unit
			min.	typ.	max.	
$V_{(BL)DSS}$	Drain-source voltage	$V_{GS}=0V$	650	-	-	V
$V_{GS(th)}$	Gate threshold voltage	$V_{GS}=V_{DS}$, $I_D=1mA$	2.0	3.0	4.0	V
$R_{DS(on)}$	Static drain-source on-resistance	$V_{GS}=10V$, $I_D=5A$, $T_J=25\text{ }^{\circ}\text{C}$	-	98	121	mΩ
		$V_{GS}=10V$, $I_D=5A$, $T_J=150\text{ }^{\circ}\text{C}$	-	181	-	
I_{DSS}	Drain-source leakage current	$V_{GS}=0V$, $V_{DS}=650V$, $T_J=25^{\circ}\text{C}$	-	2.5	50	μA
		$V_{GS}=0V$, $V_{DS}=650V$, $T_J=150^{\circ}\text{C}$	-	12.0	-	
I_{GSS}	Gate-to-source forward leakage current	$V_{GS}=20V$	-	-	400	nA
	Gate-to-source reverse leakage current	$V_{GS}=-20V$	-	-	-400	
C_{ISS}	Input capacitance	$V_{GS}=0V$, $V_{DS}=400V$, $f=1MHz$	-	735	-	pF
C_{OSS}	Output capacitance		-	30.5	-	
C_{RSS}	Reverse transfer capacitance		-	2.82	-	
Q_G	Gate charge	$V_{GS}=0\sim10V$, $V_{DS}=400V$, $I_{DS}=5A$	-	11.2	-	nC
Q_{GS}	Gate-source charge		-	2.82	-	
Q_{GD}	Gate-drain charge		-	2.07	-	
Q_{OSS}	Output charge	$V_{GS}=0V$, $V_{DS}=0\sim400V$	-	42.9	-	
$t_{D(on)}$	Turn-on delay time	$V_{DS}=400V$, $V_{GS}=0$ to $10V$, $I_{DS}=2A$, $R_G=25\Omega$	-	10.3	-	ns
$t_{D(off)}$	Turn-off delay time		-	15.6	-	
Q_{RR}	Reverse recovery charge	$I_S=5A$, $V_{DS}=400V$	-	7.5	-	nC

2- Typical Characteristic Curves

Fig 1. On-Region Characteristics

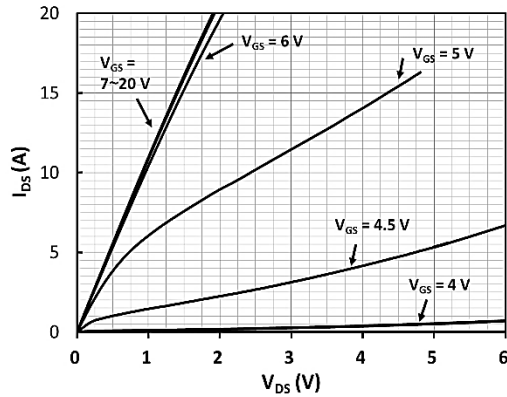


Fig 2. On-Resistance vs Drain Current and Temperature

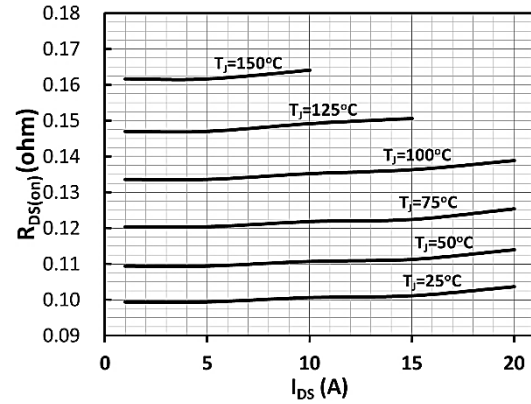


Fig 3. On-Resistance with Drain Current

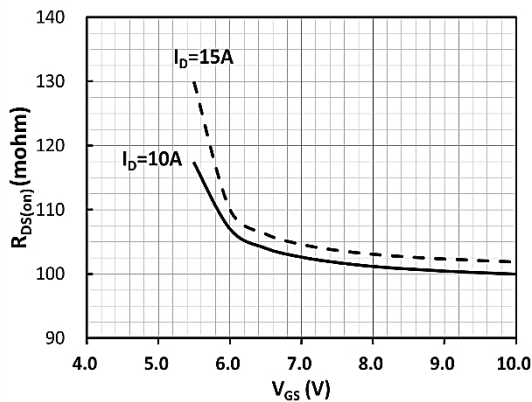


Fig 4. On-Resistance Variation with Temperature

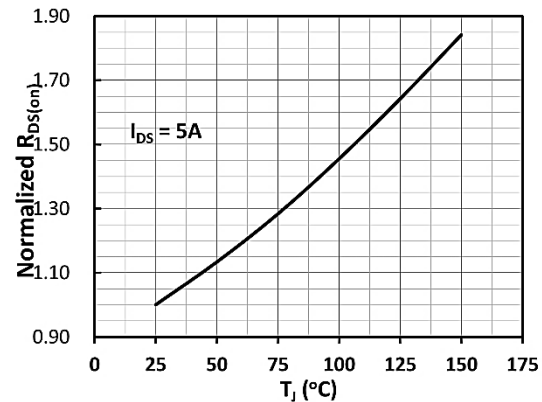


Fig 5. Threshold Voltage with Temperature

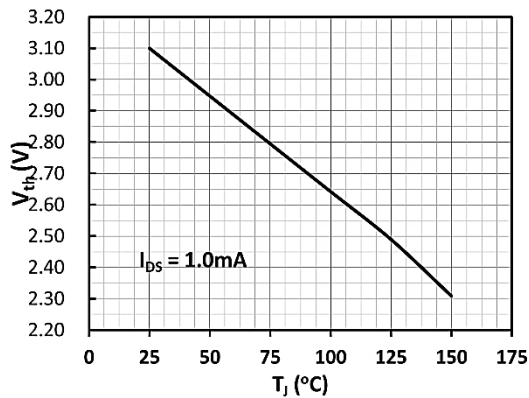


Fig 6. Capacitance Characteristics

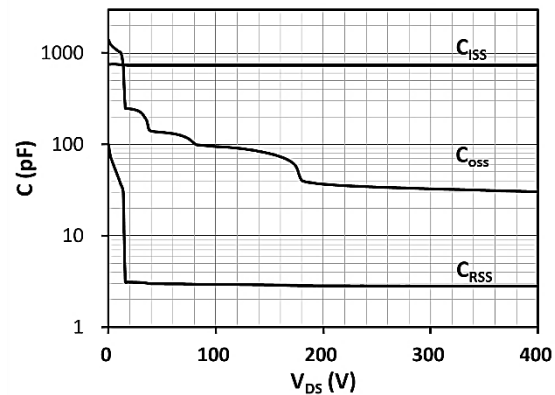


Fig 7. Gate Charge Characteristics, Q_g

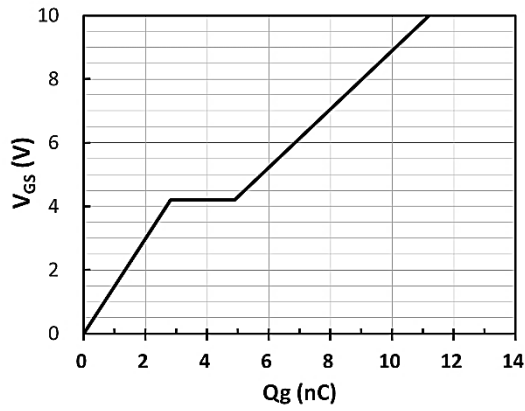


Fig 8. Capacitance Characteristics, Q_{oss}

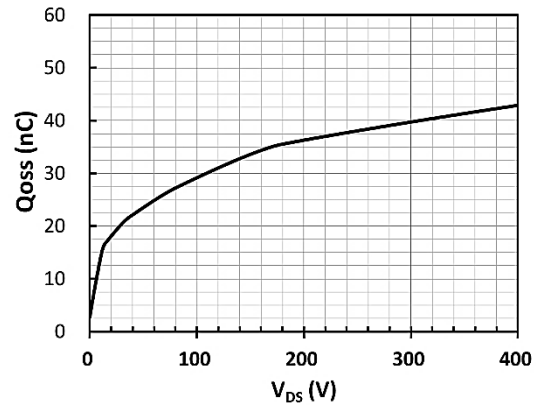
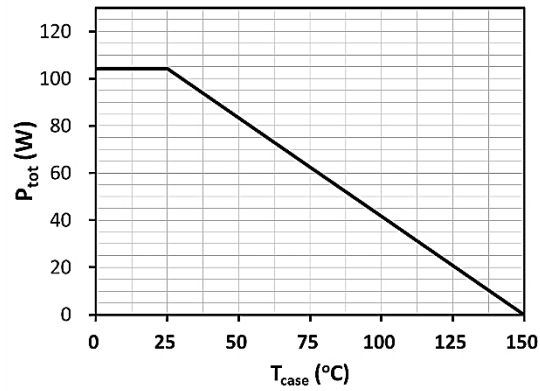
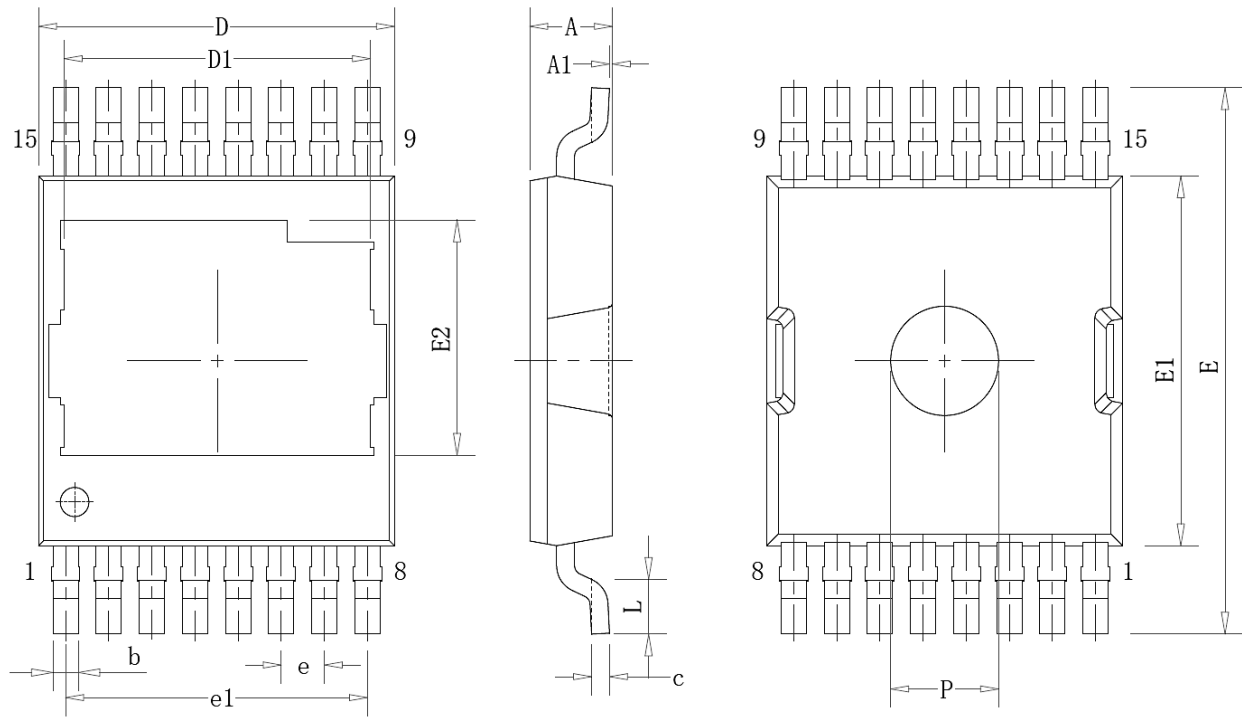


Fig 9. Power Dissipation Derating, P_{tot}



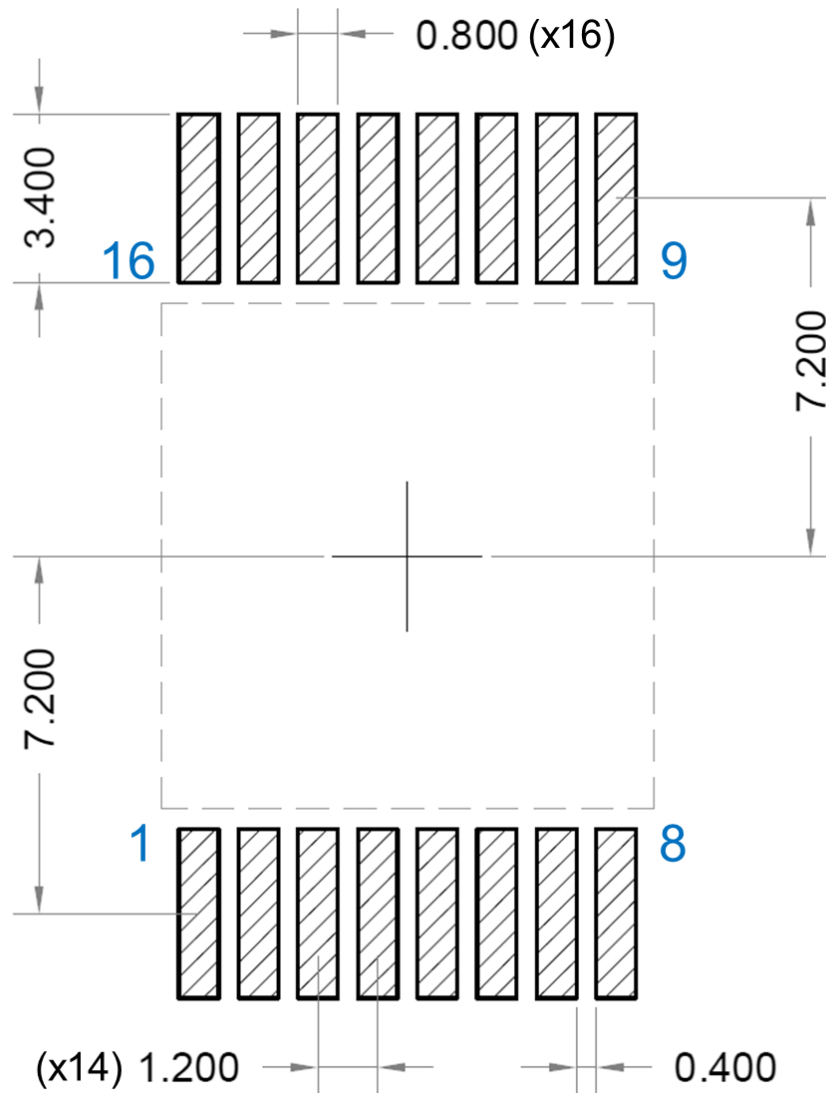
3- Package Outline Dimensions, GR-TOLT-GaN



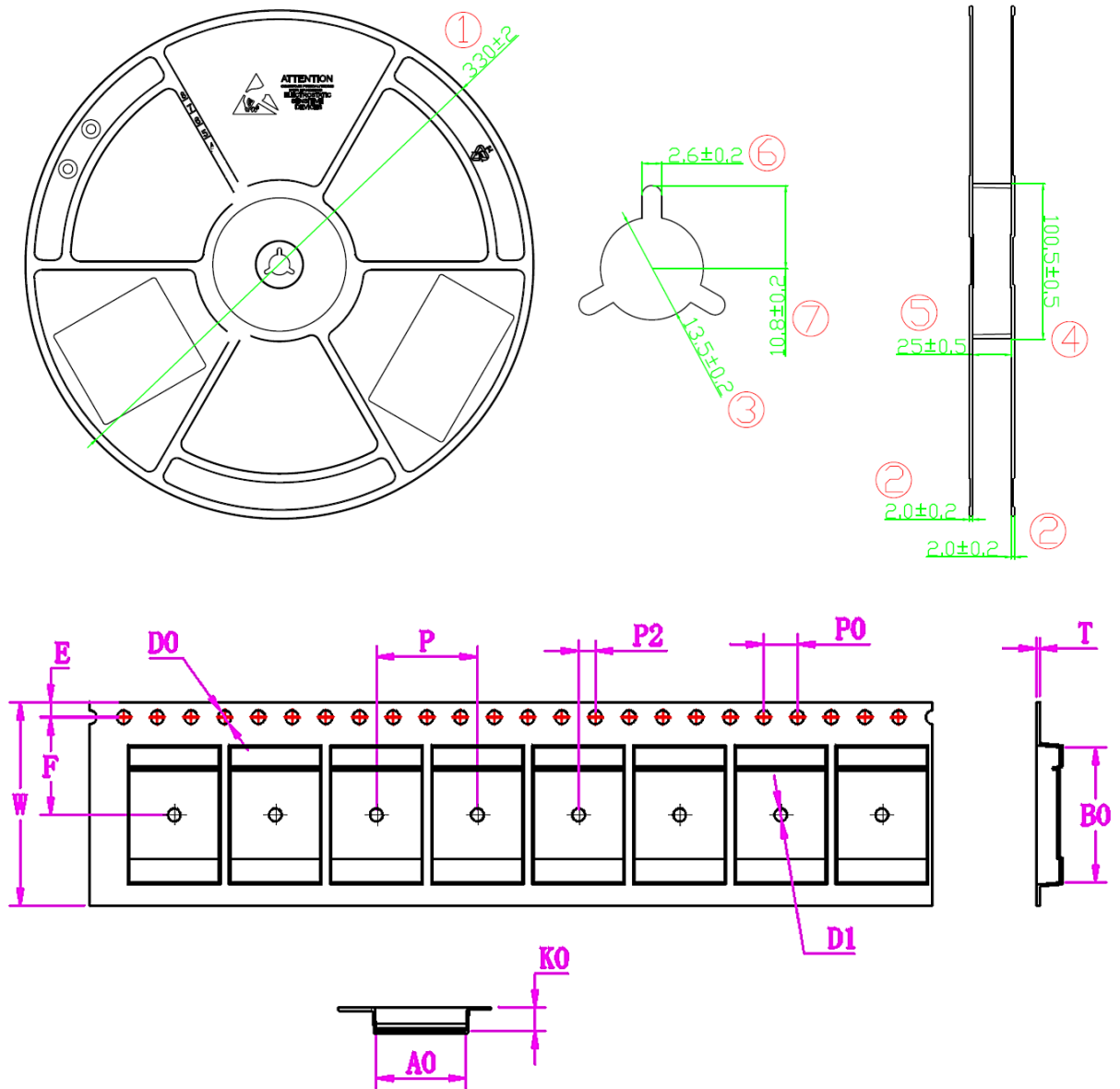
➤ Table 5 Dimension of GR-TOLT-GaN

SYMBOL	DIMENSION (IN MM)			SYMBOL	DIMENSION (IN MM)		
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.
A	2.25	2.30	2.35	E1	10.00	10.15	10.30
A1	0.01	--	0.16	E2	6.31	6.46	6.61
b	0.65	0.70	0.75	e	1.20		
c	0.45	0.50	0.55	e1	8.40		
D	9.70	9.90	11.1	L	1.40	1.50	1.60
D1	8.37	8.52	8.67	P	2.90	3.00	3.10
E	14.8	15.0	15.2				

Recommended PCB Soldering Footprint, GR-TOLT

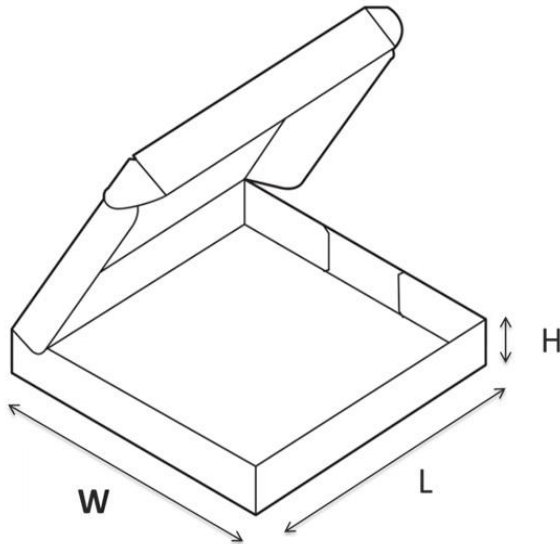


4- Tape Reel & Package Information



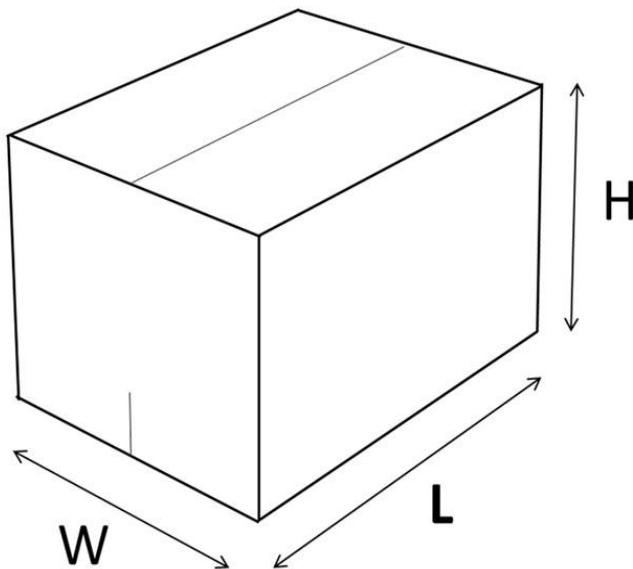
Symbol	A0	B0	K0	D0	D1	P	P0
Spec.	10.3 ± 0.1	15.6 ± 0.1	2.9 ± 0.1	1.5 ± 0.1	1.6 ± 0.1	12.0 ± 0.1	4.0 ± 0.1
Symbol	W	E	F	P2	T	-	10*P0
Spec.	24.0 ± 0.3	1.75 ± 0.1	11.5 ± 0.1	2.0 ± 0.1	0.35 ± 0.05	-	40 ± 0.2

5- Box Dimensions



	Inner BOX, mm
L	360
W	340
H	50
Weight	2.0 KG

Each box contains one Reel, and
each Reel contains 2000 components



	Outer Carton (mm)
L	380
W	360
H	340
Weight	14.5 KG

Each Carton contains 6 boxes,
Total of 12500 components

6- Change Log

Version	Date	Description
01	Nov 28, 2023	Initial version
02	August 22, 2025	Electrical characteristics, Curve and Package information revised.
03	April 16, 2026	Electrical characteristics revised

- **Note:** GaNrich semiconductor reserves the right to revise products and/or specifications without notice.