

## GR-10E005DJ: E-mode GaN Power Transistor

### Description

GR-10E005DJ is an enhancement mode GaN on Silicon power transistor. 10E005DJ provides, high current and high operating speed which is suitable for DC to DC power supply applications.

### Key Specifications

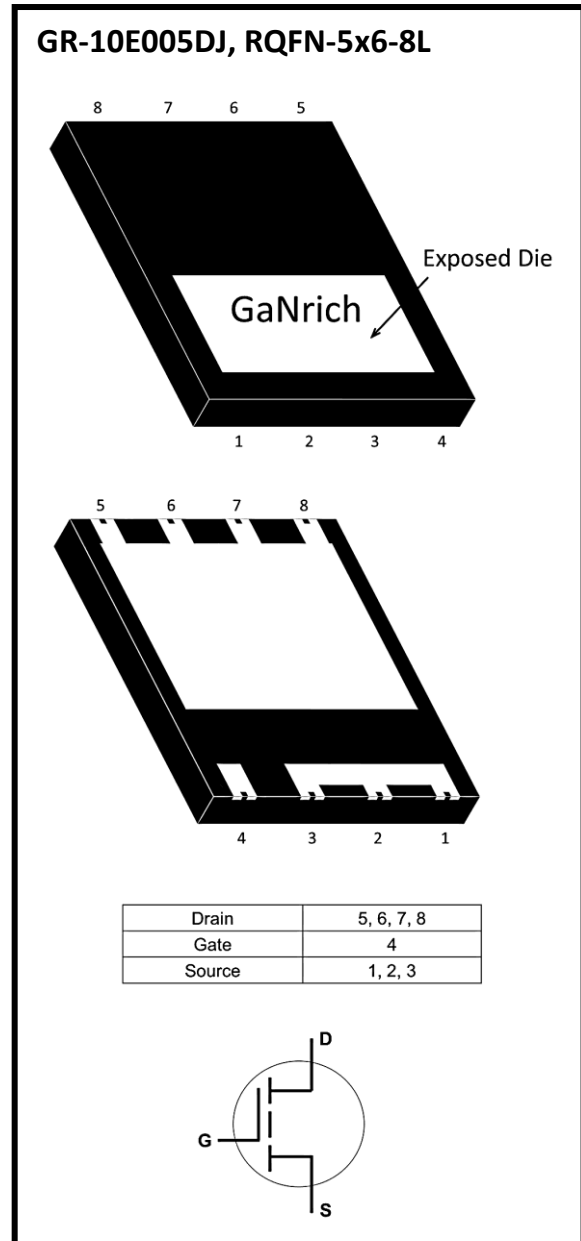
Part Number	GR-10E005DJ
V <sub>DSS</sub> , min.	100V
I <sub>DS</sub> , Pulse (25°C, TPULSE = 300 μs)	90A
R <sub>DS(ON)</sub> , typ. @V <sub>gs</sub> =6V	5.2mΩ
Q <sub>G</sub> , typ.	10.1nC

### Features

- 100 V enhancement mode power transistor
- High operating frequency
- R<sub>DS(on)</sub> = Typ. 5.2mΩ
- RoHS compliant
- Zero QRR.

### Applications

- Switch Mode Power Supplies (SMPS)
- DC-DC Converters
- Fast Battery Charging
- Appliance Motor Drives



## 1- Electrical Characteristics

➤ **Table 1 Absolute maximum ratings**

Symbol	Parameter	Value	Unit
V <sub>DSS</sub>	Drain-source voltage	100	V
V <sub>(TR)DSS</sub>	Transient drain to source voltage <sup>a</sup>	120	V
V <sub>GSS</sub>	Gate- source voltage	-6V ~ +6V	V
I <sub>D</sub>	Drain current (continuous) at T <sub>C</sub> = 25°C operation	33	A
	Drain current (continuous) at T <sub>C</sub> = 100°C operation	22.8	A
I <sub>D,pulse</sub>	Pulsed drain current (pulse width: 300μs, V <sub>gs</sub> =5V) <sup>b</sup>	90	A
T <sub>J</sub>	Operating temperature	-40 to +150	°C
T <sub>S</sub>	Storage temperature	-40 to +150	°C
MSL	Moisture sensitivity level	MSL3	

- a. In off-state, spike duty cycle D<0.01, spike duration <1μs  
b. Defined by product design and characterization. Value is not tested to full current in production

➤ **Table 2 Thermal Characteristics**

Symbol	Parameter	Value	Unit
R <sub>θJC_Top</sub>	Thermal resistance junction-case, Top	0.65	°C/W
R <sub>θJC_Bot</sub>	Thermal resistance junction-case, Bottom	0.50	°C/W
R <sub>θJA</sub>	Thermal resistance junction-ambient	60	°C/W

- a. Tested in package DFN-5x6.

➤ **Table 3 Electrical Characteristics** ( $T_{CASE} = 25\text{ }^{\circ}\text{C}$  unless otherwise stated)

Symbol	Parameter	Conditions	Values			Unit
			min.	typ.	max.	
$V_{DSS}$	Drain-source voltage	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = V_{GS}, I_D = 1mA$	0.8	1.1	1.6	V
$R_{DS(on)}$	Drain-source on-resistance	$V_{GS} = 6V, I_D = 20A$	-	5.2	6.8	m $\Omega$
$I_{DSS}$	Drain-source leakage current	$V_{DS} = 80V, V_{GS} = 0V$	-	5	400	$\mu A$
$I_{GSS}$	Gate-to-Source Forward Leakage current	$V_{GS} = +5V, T_J = 25^{\circ}\text{C}$	-	0.048	9.6	mA
	Gate-to-Source Forward Leakage current	$V_{GS} = +5V, T_J = 125^{\circ}\text{C}$	-	0.53	15.9	mA
	Gate-to-Source Reverse Leakage current	$V_{GS} = -4V, T_J = 25^{\circ}\text{C}$	-	0.035	1.05	mA
$C_{ISS}$	Input capacitance	$V_{DS} = 50V, V_{GS} = 0V$	-	862	-	pF
$C_{OSS}$	Output capacitance		-	418	-	
$C_{RSS}$	Reverse transfer capacitance		-	15	-	
$Q_G$	Gate charge	$V_{DS} = 50V, V_{GS} = 5V, I_D = 20A$	-	10.1	-	nC
$Q_{GS}$	Gate-source charge	$V_{DS} = 50V, I_D = 20A$	-	3.6	-	
$Q_{GD}$	Gate-drain charge		-	2.1	-	
$Q_{OSS}$	Output charge	$V_{DS} = 50V, V_{GS} = 0V$	-	35.7	-	
$Q_{RR}$	Source-Drain Recovery Charge	-	-	0	-	

## 2- Typical Characteristic Curves

Fig 1. On-Region Characteristics

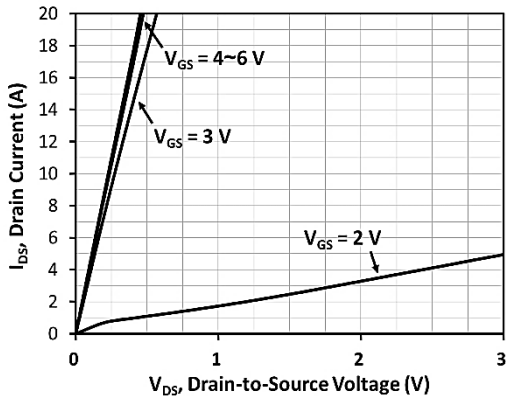


Fig 2. On-Resistance vs Drain Current and Temperature

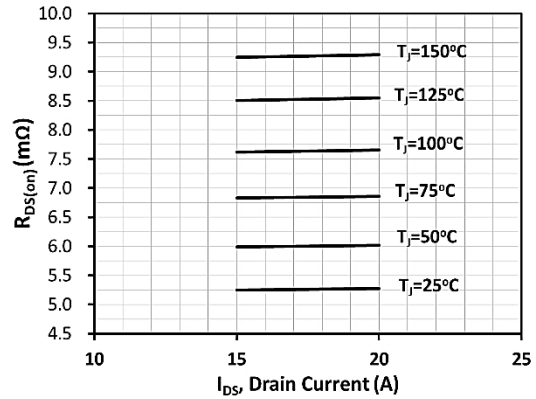


Fig 3. On-Resistance with Drain Current

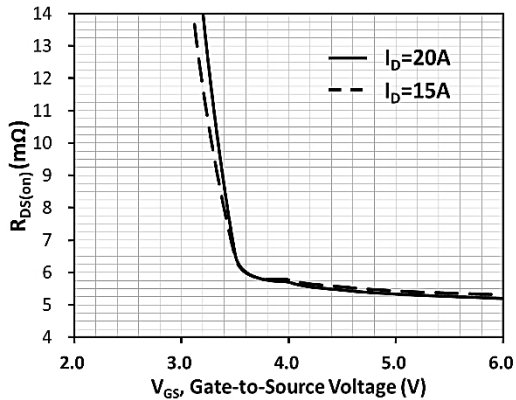


Fig 4. On-Resistance Variation with Temperature

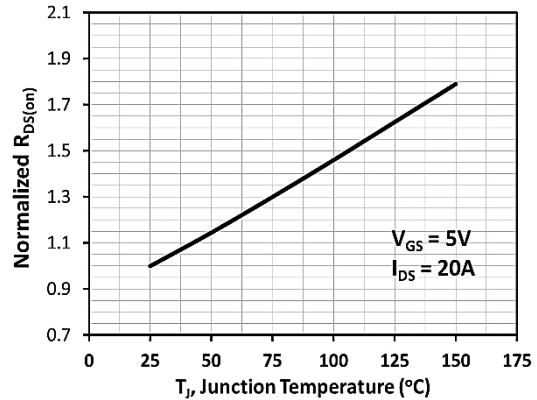


Fig 5. Threshold Voltage with Temperature

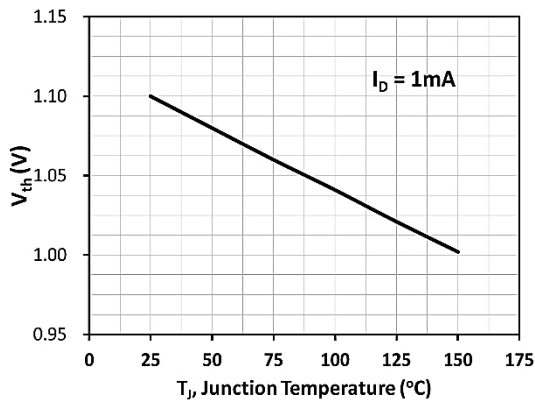


Fig 6. Capacitance Characteristics

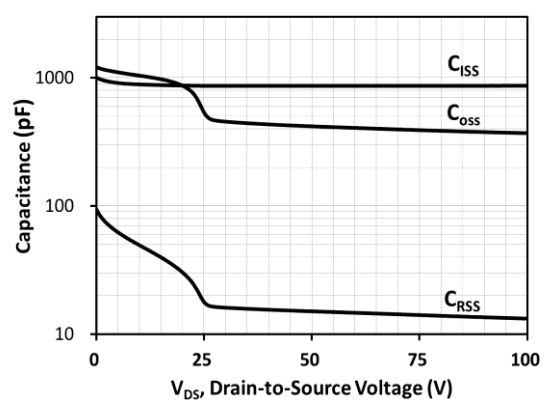


Fig 7. Gate Charge Characteristics, Qg

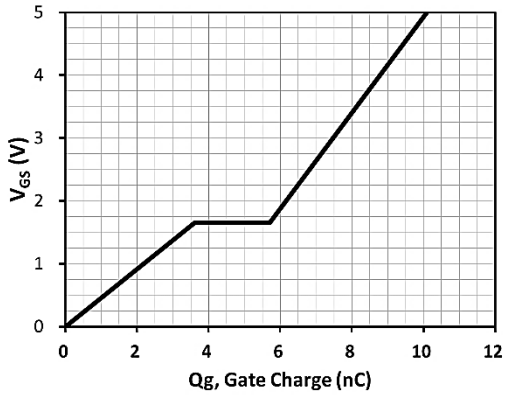
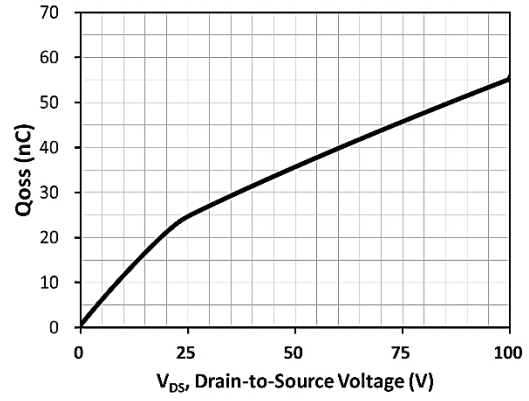
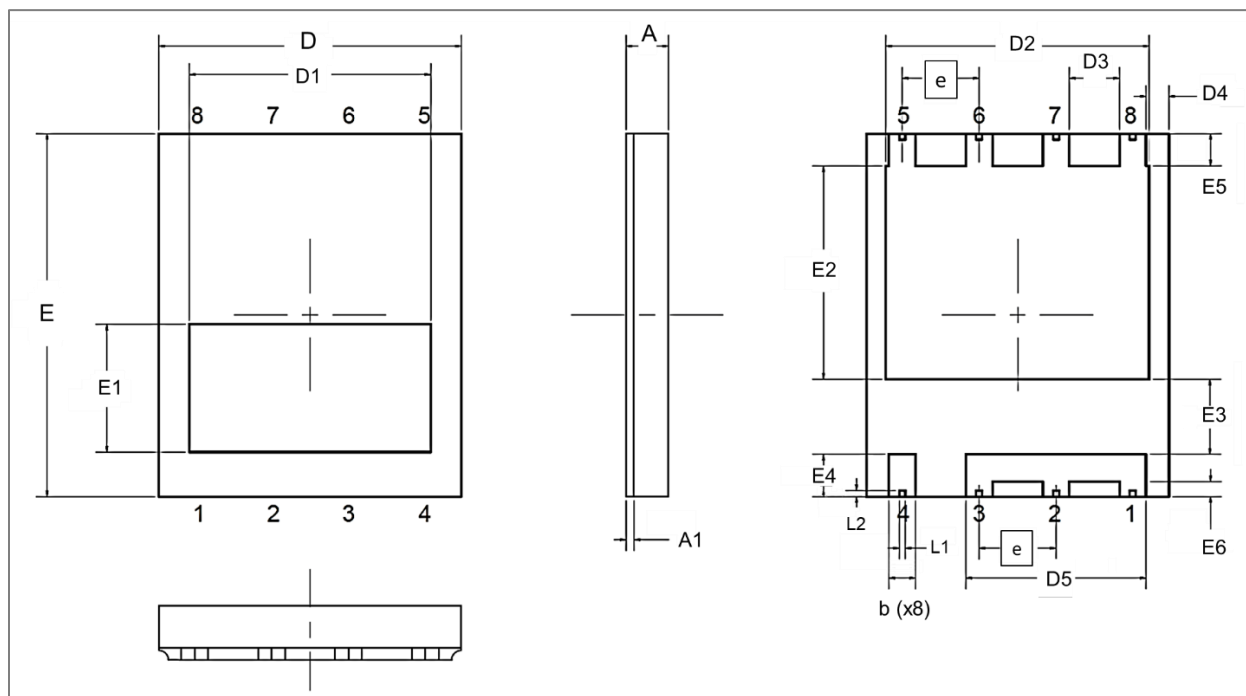


Fig 8. Capacitance Characteristics, Qoss



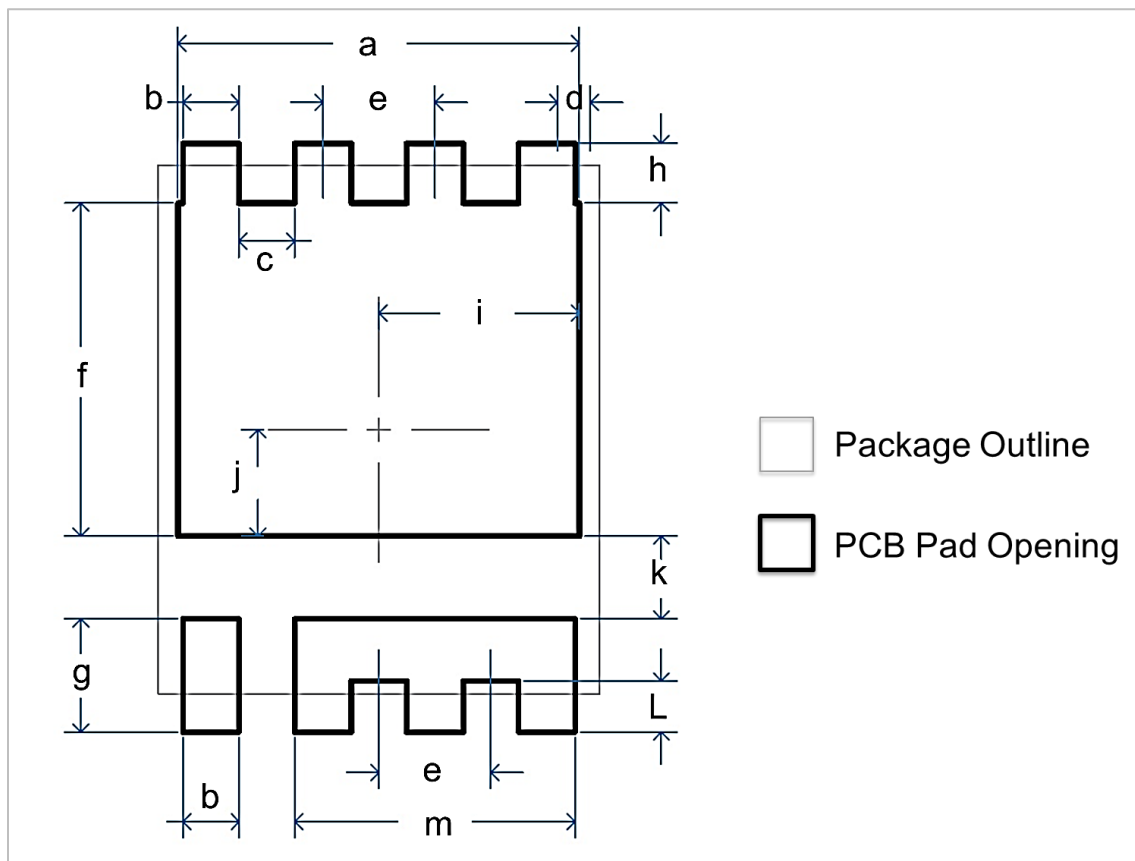
### 3- Package Outline Dimensions



➤ Table 4 Dimension of GR-RQFN-5x6-8L

SYMBOL	DIMENSION (IN MM)			SYMBOL	DIMENSION (IN MM)		
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.
<b>A</b>	---	---	0.70	<b>D5</b>	2.88	2.98	3.08
<b>A1</b>	0.13			<b>E1</b>	2.112 REF		
<b>A2</b>	0.42	0.45	0.48	<b>E2</b>	3.43	3.53	3.63
<b>D</b>	4.90	5.00	5.10	<b>E3</b>	1.14	1.24	1.34
<b>E</b>	2.90	6.00	3.10	<b>E4</b>	0.60	0.70	0.80
<b>e</b>	1.270 BSC			<b>E5</b>	0.43	0.53	0.63
<b>b</b>	0.34	0.44	0.54	<b>E6</b>	0.15	0.25	0.35
<b>D1</b>	3.994 REF			<b>L1</b>	0.05	0.10	0.20
<b>D2</b>	4.25	4.35	4.45	<b>L2</b>	0.05	0.10	0.20
<b>D3</b>	0.73	0.83	0.93				
<b>D4</b>	0.275	0.375	0.475				

**Recommended PCB footprint**



➤ **Table 5 PCB Footprint Dimension**

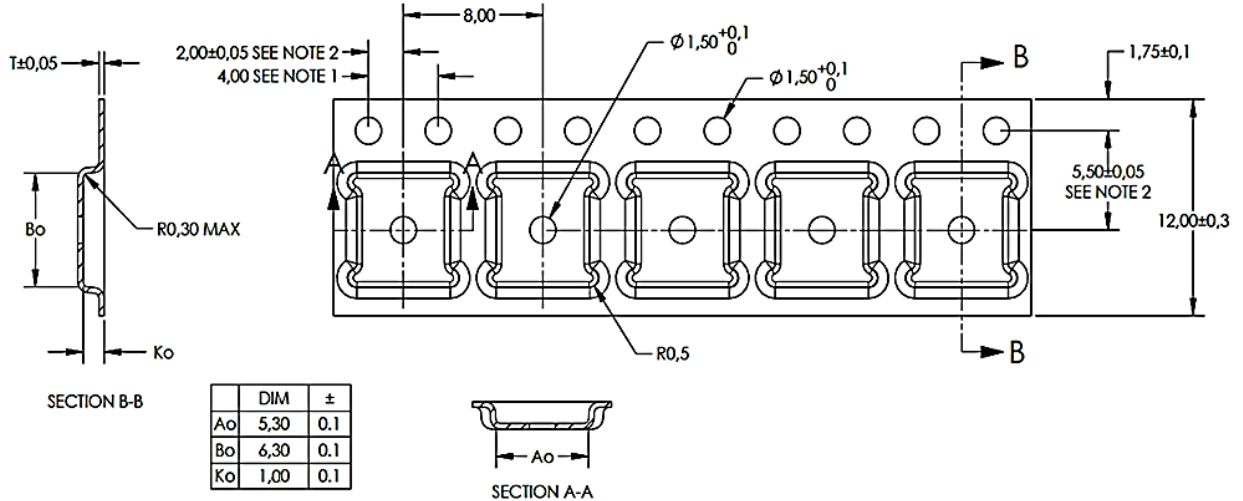
SYMBOL	DIMENSION	SYMBOL	DIMENSION
<b>a</b>	4.550	<b>h</b>	0.680
<b>b</b>	0.640	<b>i</b>	2.275
<b>c</b>	0.630	<b>j</b>	1.210
<b>d</b>	0.375	<b>k</b>	0.940
<b>e</b>	1.270	<b>L</b>	0.580
<b>f</b>	3.780	<b>m</b>	3.180
<b>g</b>	1.280	-	-

Notes:

- (1) All dimensions are in mm.
- (2) Drawing is not to Scale.

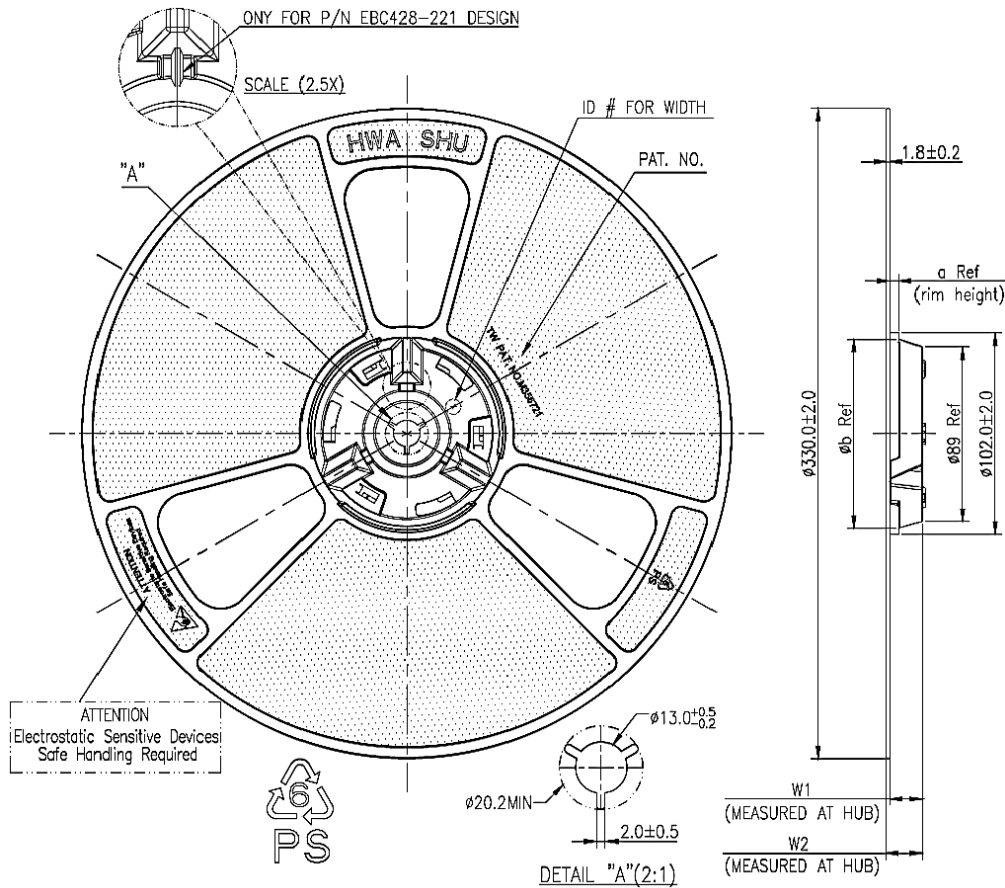
### 4- Tape and Reel Informaion

13" Reel, Carrier Tape W=12mm



Unit: mm

5-



6-

## 5- Change Log

Version	Date	Description
0.1	March 28, 2025	Initial version
0.2	October 22, 2025	Revised electrical characteristic curves
0.3	April 16, 2026	Electrical characteristics revised

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