

- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

Product Summary



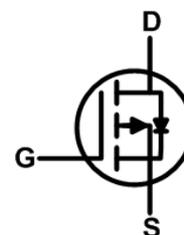
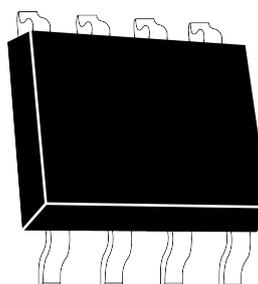
BVDSS	RDSON	ID
-30V	5.8 mΩ	-18A

General Description

The JH4409A is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The JH4409A meet the RoHS and Green Product requirement 100% EAS guaranteed with full function reliability approved.

SOP8 Pin Configuration



Absolute Maximum Ratings (T_A= 25°C, unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source voltage	V _{DS}	-30	V
Gate-Source voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	T _A =25°C	-18
		T _A =100°C	-8.8
Pulsed Drain Current ¹	I _{DM}	-53	A
Single Pulse Avalanche Energy ²	EAS	80	mJ
Total Power Dissipation	P _D	3	W
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ³	R _{θJA}	41.6	°C/W

Electrical Characteristics (T_J = 25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-30	-	-	V
Gate-body Leakage current	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T _J =25°C	V _{DS} = -30V, V _{GS} = 0V	-	-	-1	μA
	T _J =100°C		-	-	-100	
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.0	-	-2.5	V
Drain-Source On-Resistance ⁴	R _{DS(on)}	V _{GS} = -10V, I _D = -12A	-	5.8	9.2	mΩ
		V _{GS} = -4.5V, I _D = -10A	-	8	14	
Forward Transconductance ⁴	g _{fs}	V _{DS} = -10V, I _D = -10A	-	50	-	S
Dynamic Characteristics⁵						
Input Capacitance	C _{iss}	V _{DS} = -15V, V _{GS} = 0V, f = 1MHz	-	3100	-	pF
Output Capacitance	C _{oss}		-	430	-	
Reverse Transfer Capacitance	C _{rss}		-	358	-	
Gate Resistance	R _g	f=1MHz	-	9.5	-	Ω
Switching Characteristics⁵						
Total Gate Charge	Q _g	V _{GS} = -10V, V _{DS} = -15V I _D = -12A	-	35	-	nC
Gate-Source Charge	Q _{gs}		-	9.9	-	
Gate-Drain Charge	Q _{gd}		-	10.5	-	
Turn-On Delay Time	t _{d(on)}	V _{GS} = -10V, V _{DD} = -15V R _G = 3Ω, I _D = -12A	-	10.8	-	ns
Rise Time	t _r		-	13.2	-	
Turn-Off Delay Time	t _{d(off)}		-	73	-	
Fall Time	t _f		-	35	-	
Reverse Recovery Time	t _{rr}	I _F = -12A, dI _F /dt = 100A/μs	-	25	-	ns
Reverse Recovery Charge	Q _{rr}		-	10	-	nC
Drain-source body diode Characteristics						
Diode Forward Voltage ⁴	V _{SD}	I _S = -1A, V _{GS} = 0V	-	-	-1.2	V
Continuous Source Current	I _S	T _A =25°C	-	-	-14	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C.
2. The EAS data shows Max. rating . The test condition is V_{DD}= -25V, V_{GS}= -10V, L=0.1mH, I_{AS}= -40A.
3. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
4. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

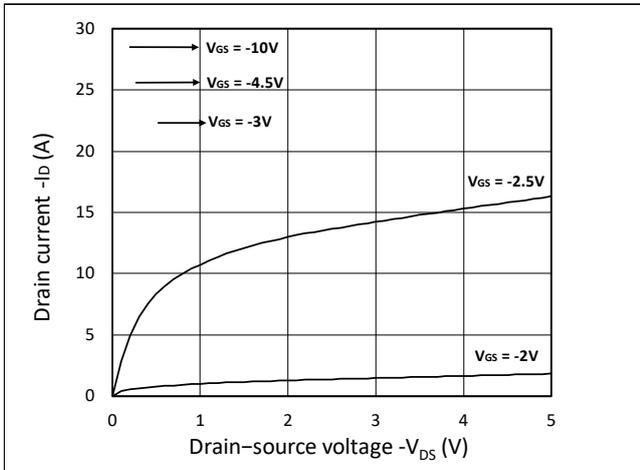


Figure 1. Output Characteristics

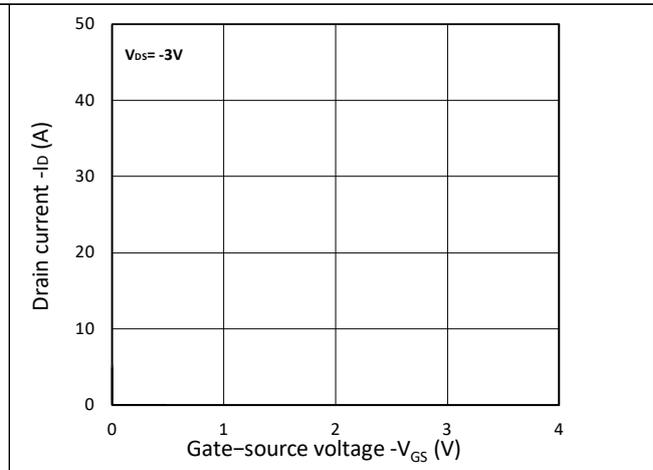


Figure 2. Transfer Characteristics

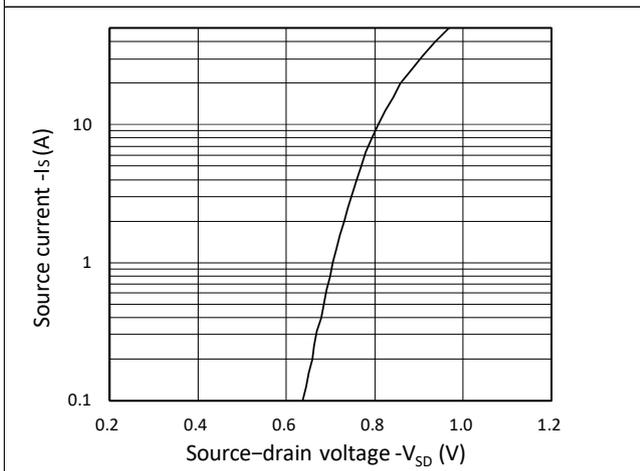


Figure 3. Forward Characteristics of Reverse

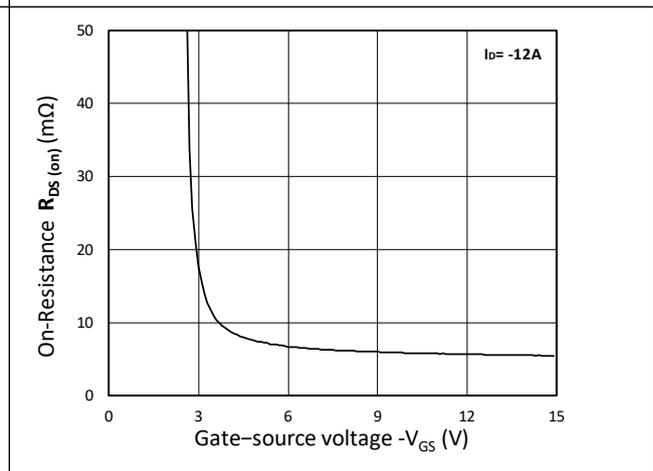


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

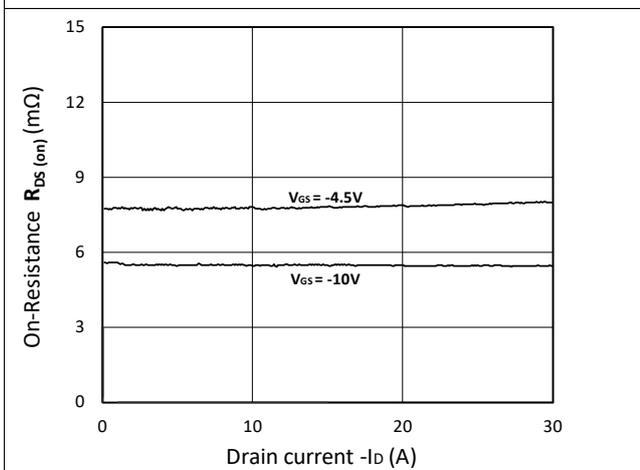


Figure 5. $R_{DS(ON)}$ vs. I_D

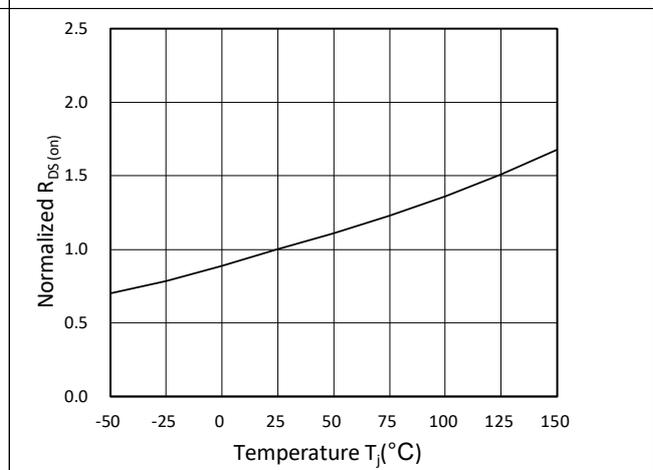


Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature

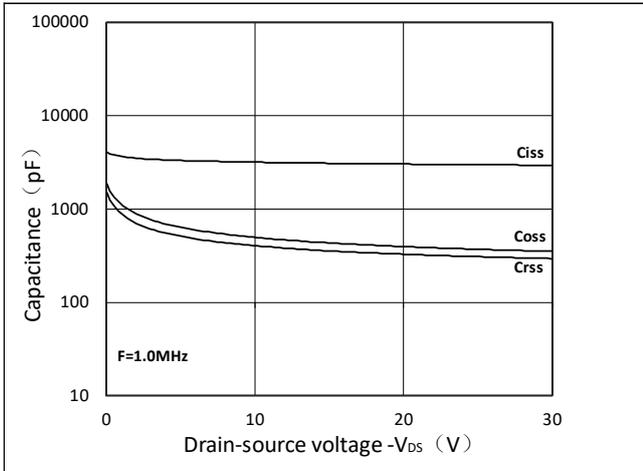


Figure 7. Capacitance Characteristics

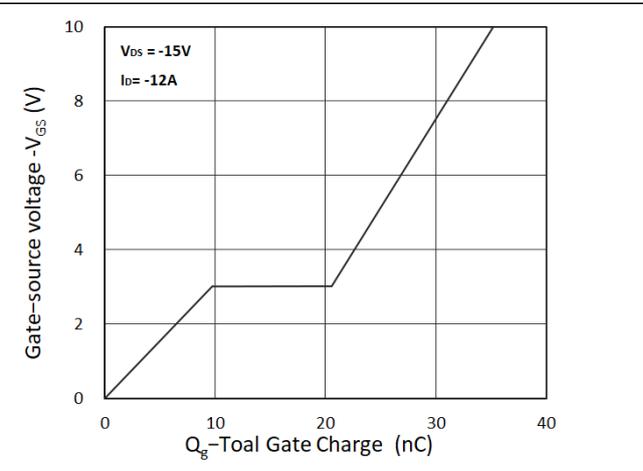


Figure 8. Gate Charge Characteristics

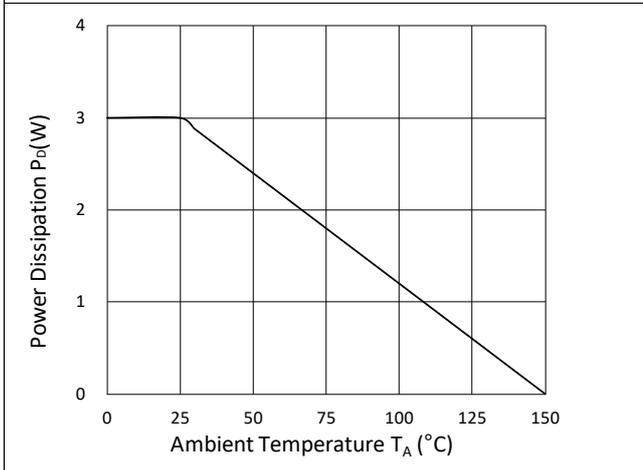


Figure 9. Power Dissipation

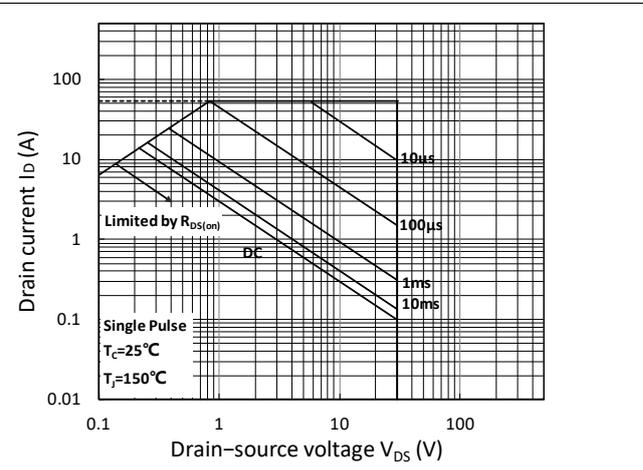


Figure 10. Safe Operating Area

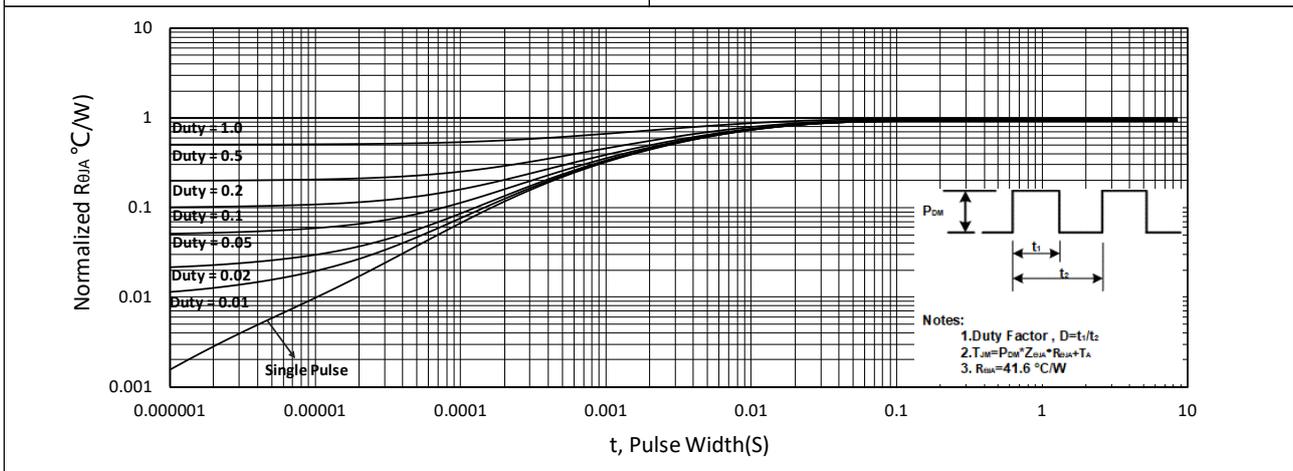


Figure 11. Normalized Maximum Transient Thermal Impedance

Test Circuit

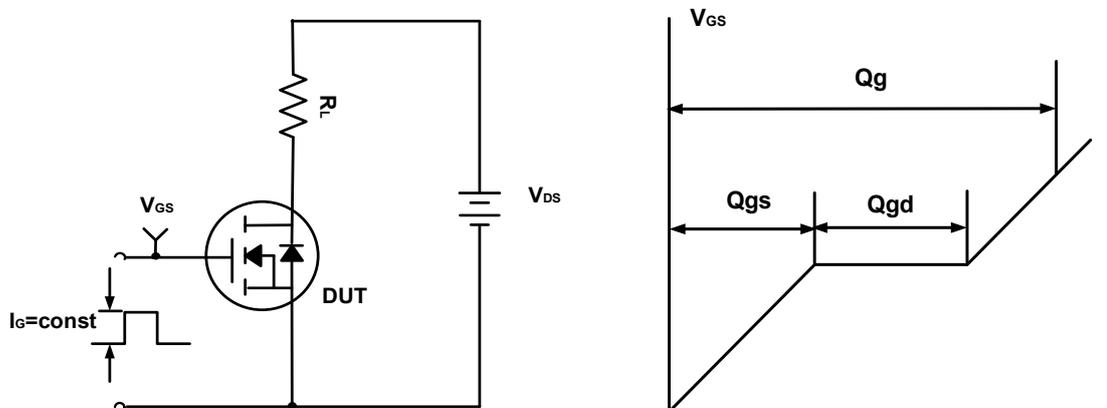


Figure A. Gate Charge Test Circuit & Waveforms

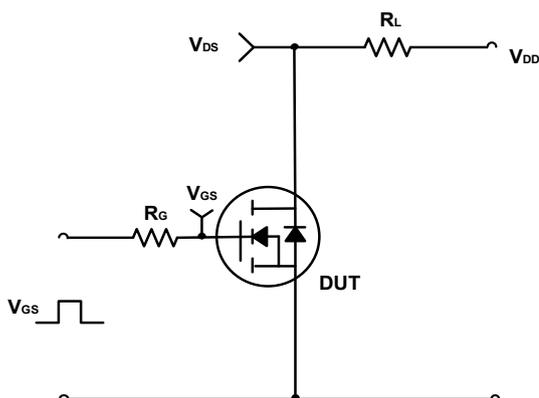


Figure B. Switching Test Circuit & Waveforms

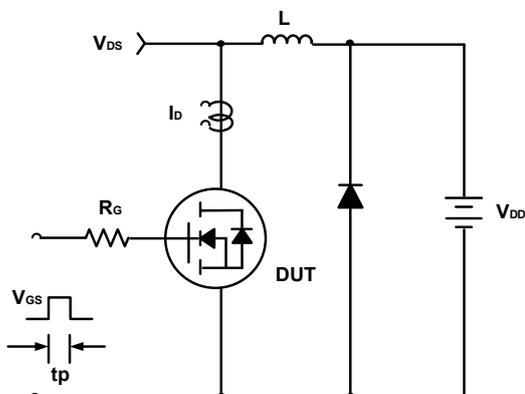
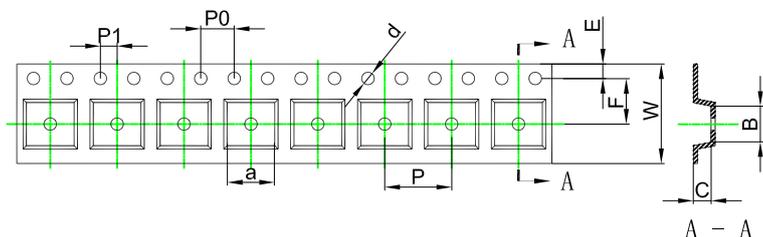


Figure C. Unclamped Inductive Switching Circuit & Waveforms

SOP8 Tape and Reel Information

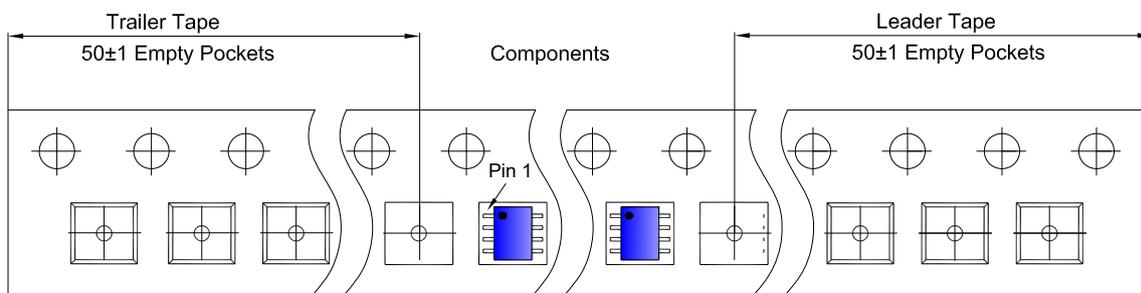
Embossed Carrier Tape



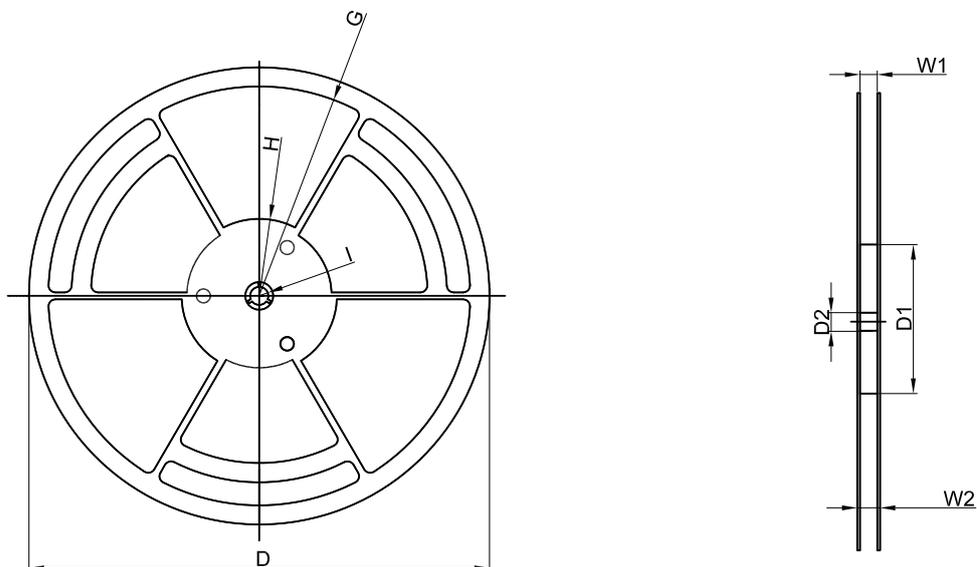
Dimensions are in millimeter

Pkg type	a	B	C	d	E	F	P0	P	P1	W
SOP8	6.40	5.40	2.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

Tape Leader and Trailer



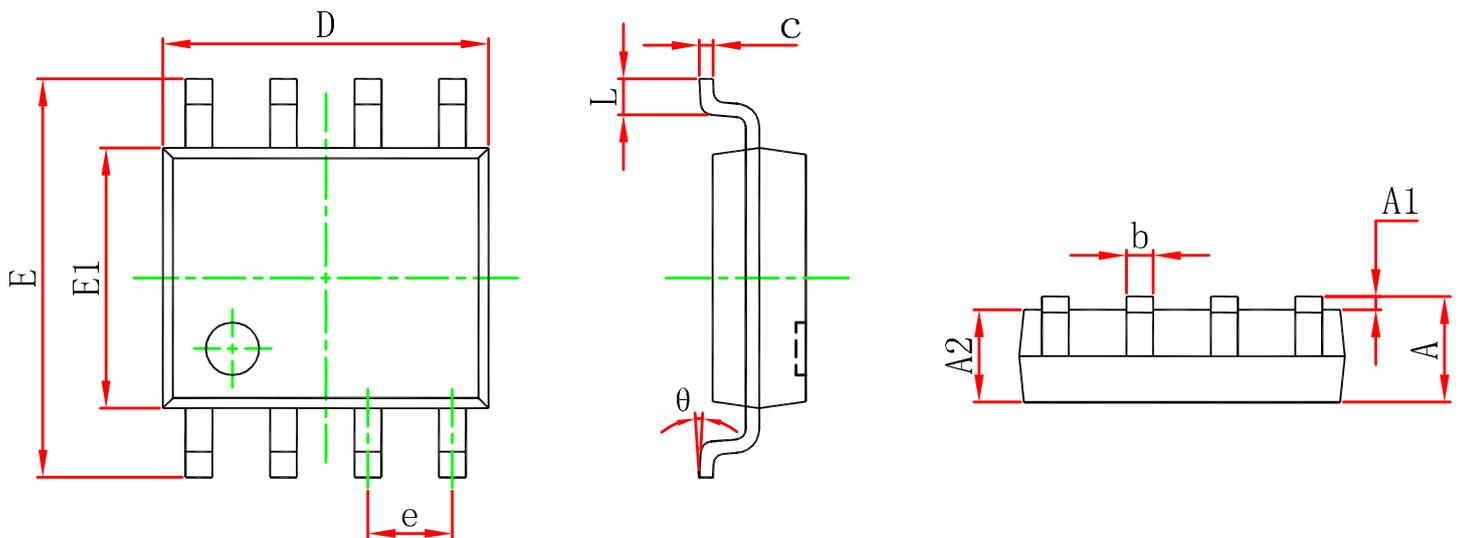
Reel



Dimensions are in millimeter

Reel Option	D	D1	D2	G	H	I	W1	W2
13" Dia	Ø330.00	100.00	13.00	R151.00	R56.00	R6.50	12.40	17.60

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3,000 pcs	13 inch	6,000 pcs	360×360×65	48,000 pcs	565×380×390	



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.450	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.201
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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