

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

## Product Summary

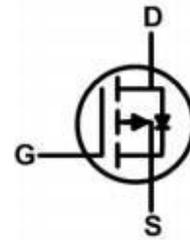
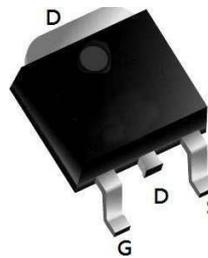


BVDSS	RDSON	ID
-60V	22.5mΩ	-50A

## Description

The JH50P06 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 JH50P06 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

## TO-252 Pin Configuration



## Absolute Maximum Ratings (T<sub>A</sub> = 25°C, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V <sub>DS</sub>	-60	V
Gate-Source Voltage		V <sub>GS</sub>	±20	V
Continuous Drain Current	T <sub>C</sub> = 25°C	I <sub>D</sub>	-50	A
	T <sub>C</sub> = 100°C		-22	
Pulsed Drain Current <sup>1</sup>		I <sub>DM</sub>	-140	A
Single Pulse Avalanche Energy <sup>2</sup>		EAS	115.2	mJ
Total Power Dissipation	T <sub>C</sub> = 25°C	P <sub>D</sub>	58	W
Operating Junction and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C

## Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient <sup>3</sup>	R <sub>θJA</sub>	65	°C/W
Thermal Resistance from Junction-to-Case	R <sub>θJC</sub>	2.15	°C/W

## Electrical Characteristics (T<sub>J</sub> = 25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-60	-	-	V
Gate-body Leakage current	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T <sub>J</sub> = 25°C	V <sub>DS</sub> = -60V, V <sub>GS</sub> = 0V	-	-	-1	μA
	T <sub>J</sub> = 100°C		-	-	-100	
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-1	-1.6	-2.5	V
Drain-Source On-Resistance <sup>4</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -10A	-	22.5	28	mΩ
		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -6A	-	25.5	35	
Forward Transconductance <sup>4</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -10V, I <sub>D</sub> = -10A	-	32	-	S
<b>Dynamic Characteristics<sup>5</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V, f = 1MHz	-	4295	-	pF
Output Capacitance	C <sub>oss</sub>		-	168	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	140	-	
Gate Resistance	R <sub>g</sub>	f = 1MHz	-	4	-	Ω
<b>Switching Characteristics<sup>5</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> = -10V, V <sub>DS</sub> = -30V, I <sub>D</sub> = -10A	-	75	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	7.6	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	8.8	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> = -10V, V <sub>DD</sub> = -30V, R <sub>G</sub> = 3Ω, I <sub>D</sub> = -10A	-	22	-	ns
Rise Time	t <sub>r</sub>		-	25	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	86	-	
Fall Time	t <sub>f</sub>		-	30	-	
<b>Drain-Source Body Diode Characteristics</b>						
Diode Forward Voltage <sup>4</sup>	V <sub>SD</sub>	I <sub>S</sub> = -10A, V <sub>GS</sub> = 0V	-	-	-1.2	V
Continuous Source Current	I <sub>S</sub>	T <sub>C</sub> = 25°C	-	-	-50	A

### Notes:

1. Repetitive rating, pulse width limited by junction temperature T<sub>J(MAX)</sub>=150°C.
2. The EAS data shows Max. rating . The test condition is V<sub>DD</sub>= -25V, V<sub>GS</sub>= -10V, L= 0.4mH, I<sub>AS</sub>= -24A.
3. The data tested by surface mounted on a 1 inch<sup>2</sup> 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

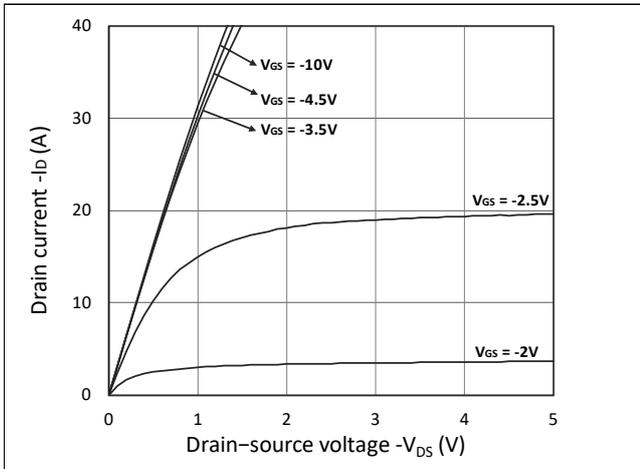


Figure 1. Output Characteristics

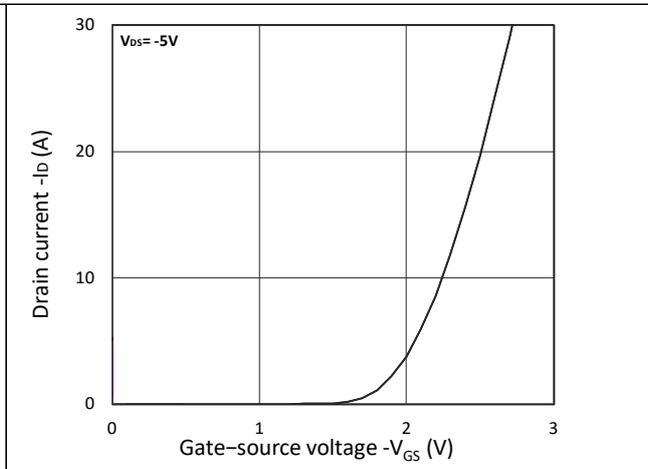


Figure 2. Transfer Characteristics

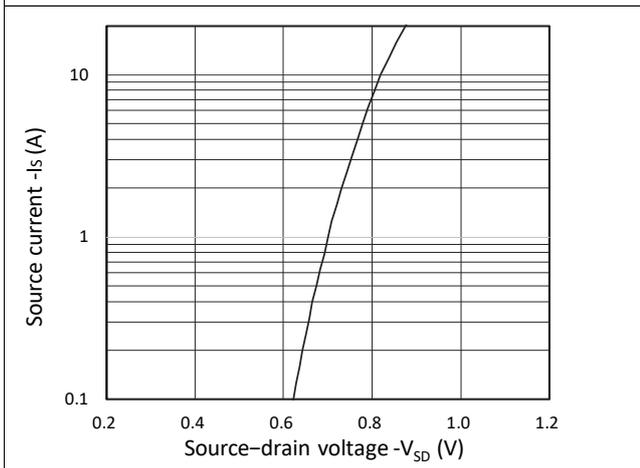


Figure 3. Forward Characteristics of Reverse

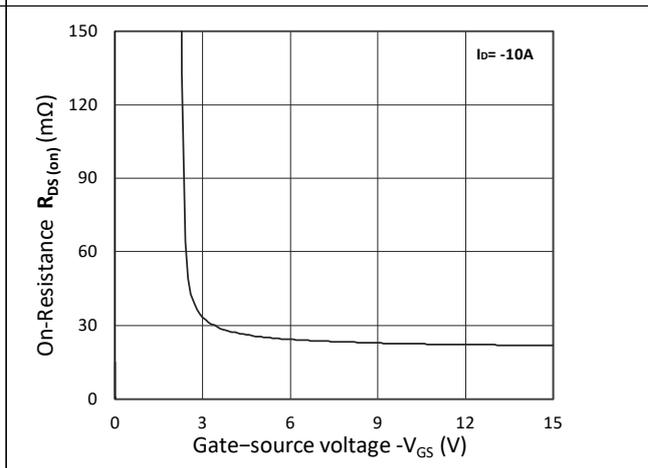


Figure 4.  $R_{DS(ON)}$  vs.  $V_{GS}$

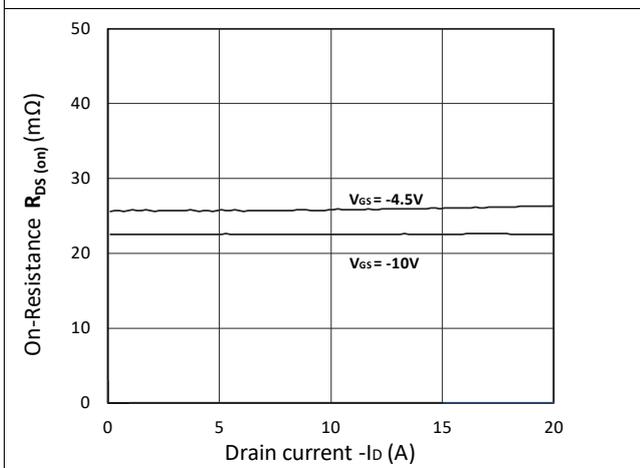


Figure 5.  $R_{DS(ON)}$  vs.  $I_D$

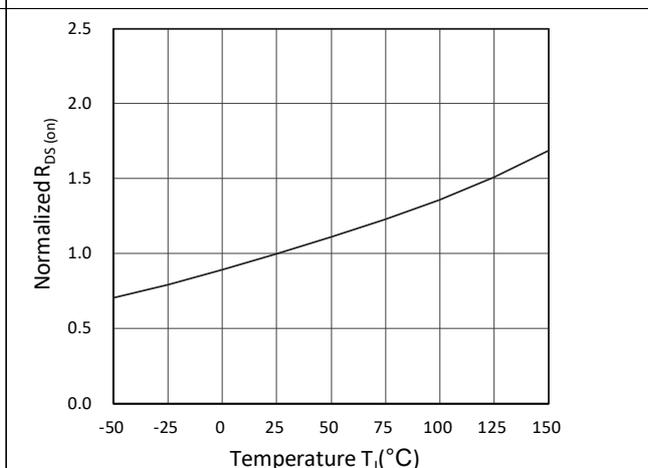


Figure 6. Normalized  $R_{DS(ON)}$  vs. Temperature

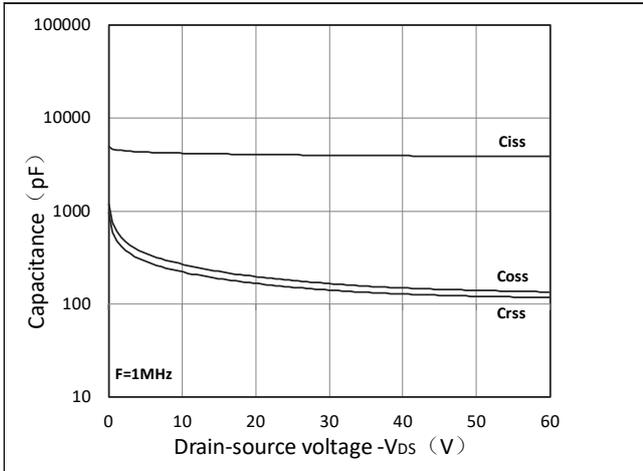


Figure 7. Capacitance Characteristics

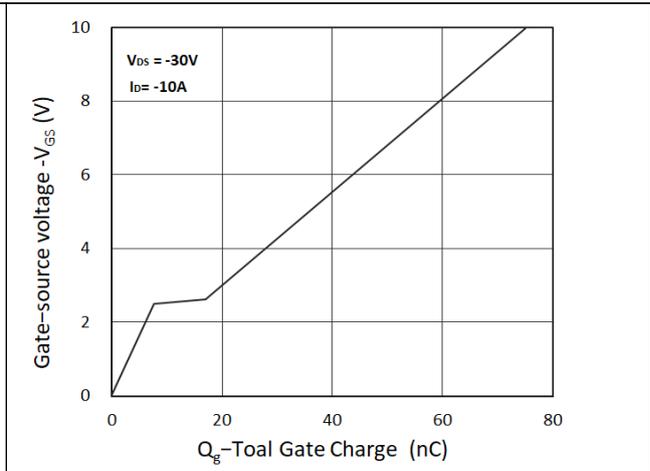


Figure 8. Gate Charge Characteristics

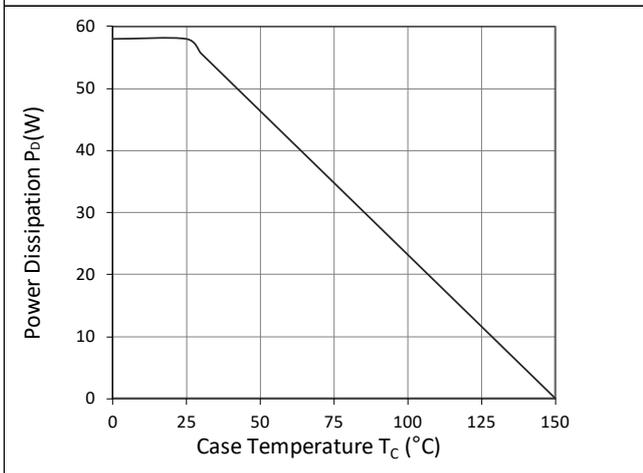


Figure 9. Power Dissipation

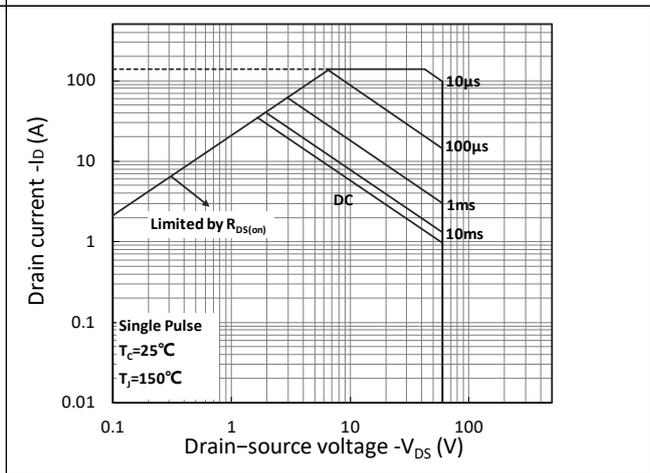


Figure 10. Safe Operating Area

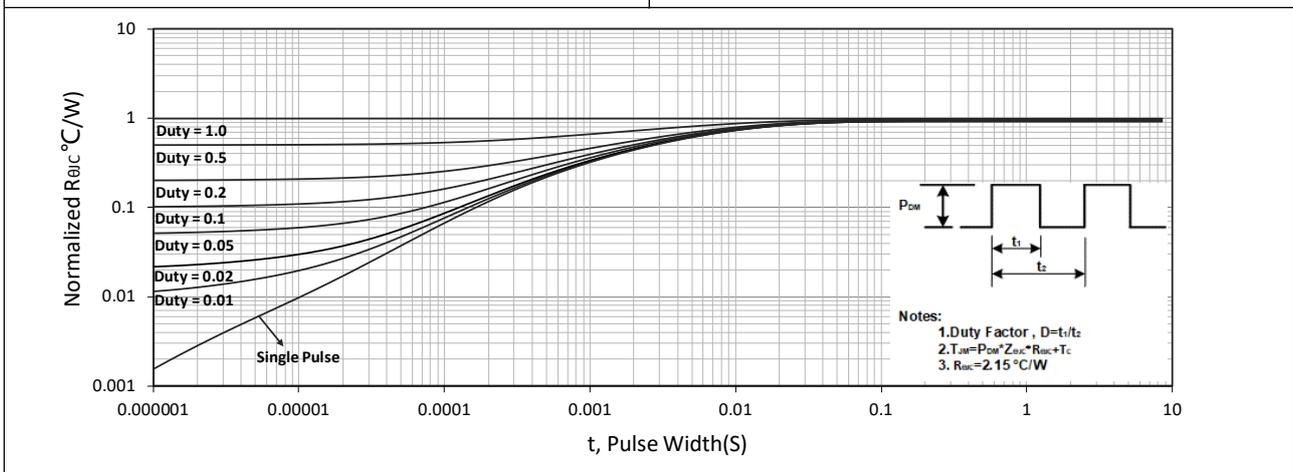


Figure 11. Normalized Maximum Transient Thermal Impedance

### Test Circuit

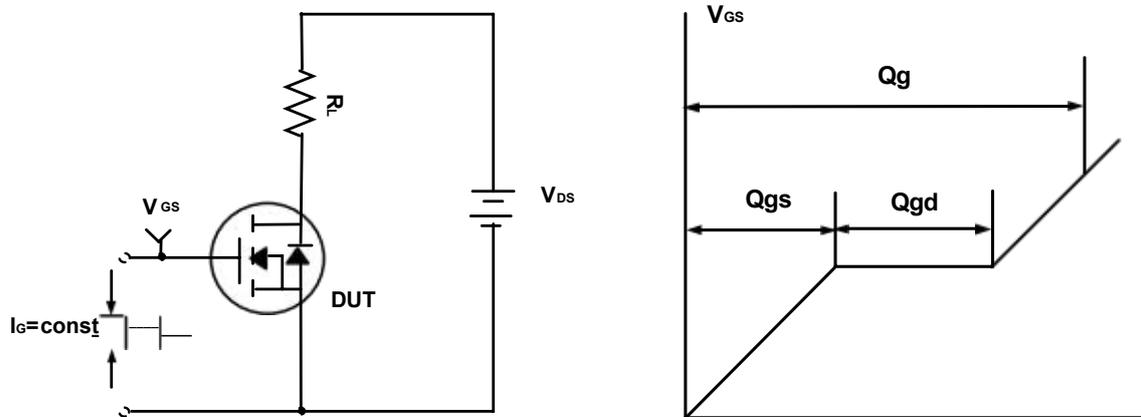


Figure A. Gate Charge Test Circuit & Waveforms

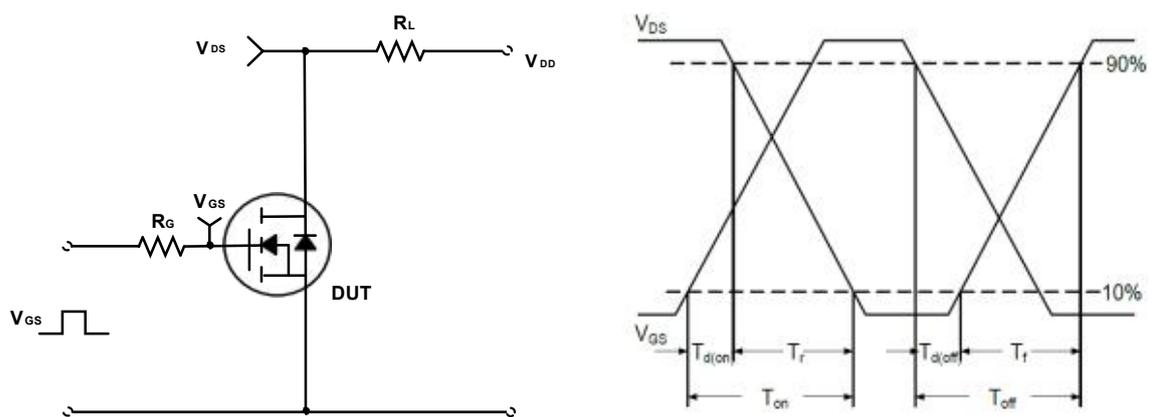


Figure B. Switching Test Circuit & Waveforms

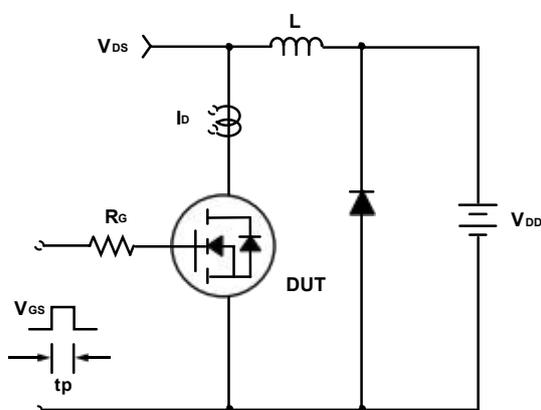
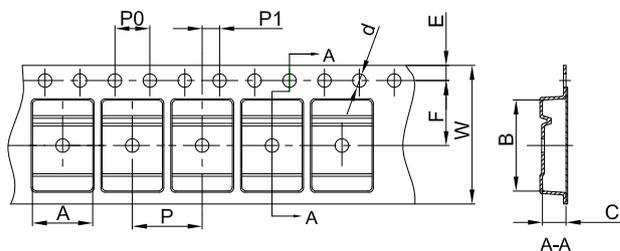


Figure C. Unclamped Inductive Switching Circuit & Waveforms

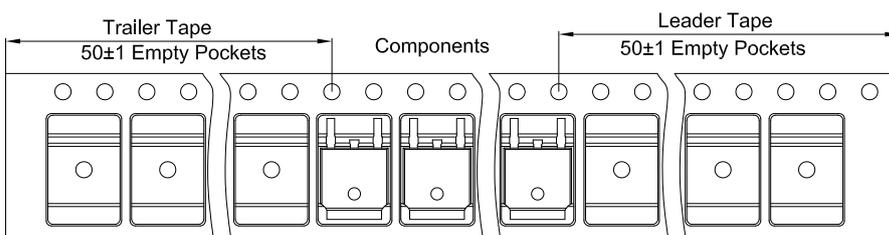
## TO-252-2L Tape and Reel

### TO-252 Embossed Carrier Tape

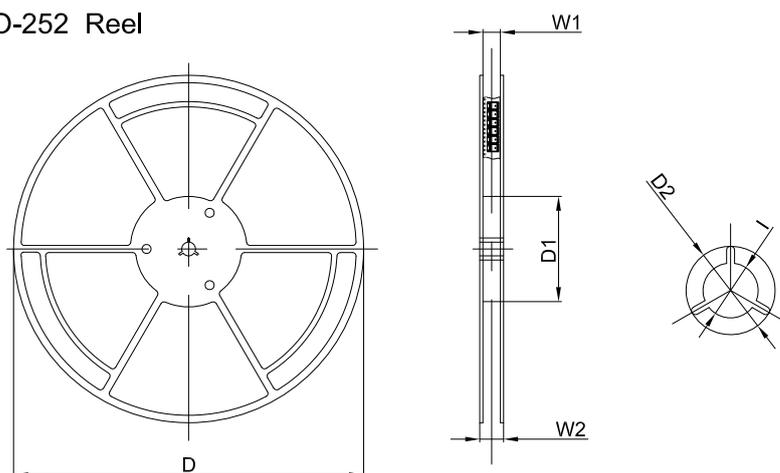


Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
TO-252	6.90	10.50	2.70	Ø1.55	1.75	7.50	4.00	8.00	2.00	16.00

### TO-252 Tape Leader and Trailer

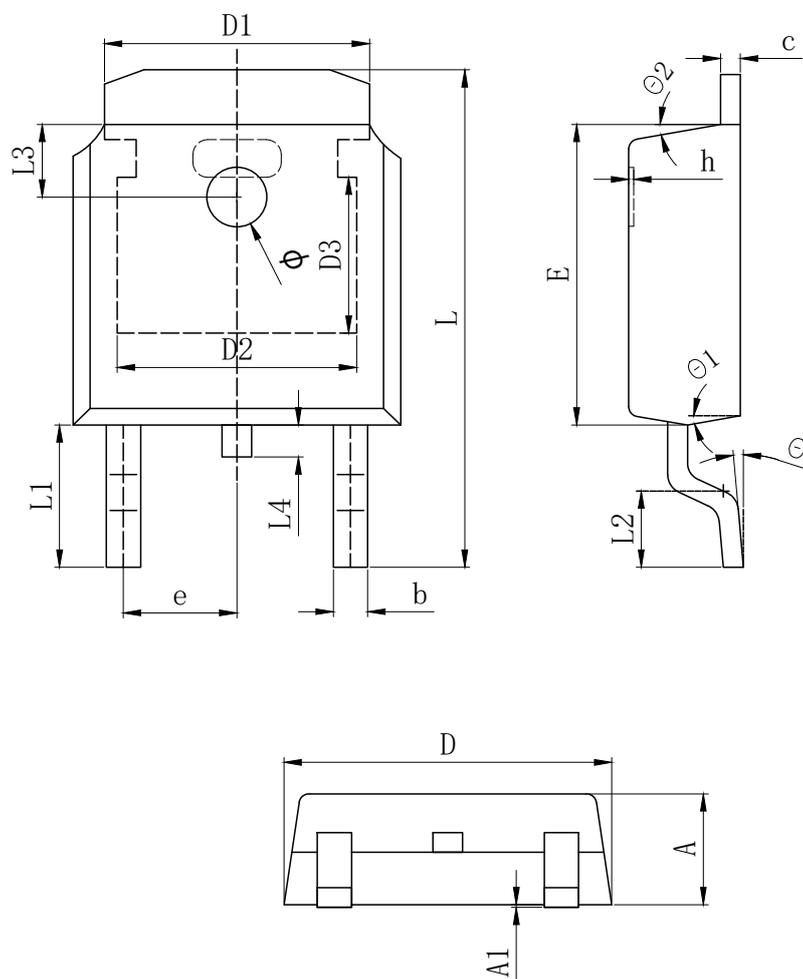


### TO-252 Reel



Dimensions are in millimeter						
Reel Option	D	D1	D2	W1	W2	I
13"Dia	330.00	100.00	Ø21.00	16.40	21.00	Ø13.00

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
2,500 pcs	13inch	2,500 pcs	340×336×29	25,000 pcs	353×346×365	



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	2.200	2.300	2.400
A1	0.000		0.127
b	0.640	0.690	0.740
c (电镀后)	0.460	0.520	0.580
D	6.500	6.600	6.700
D1	5.334 REF		
D2	4.826 REF		
D3	3.166 REF		
E	6.000	6.100	6.200
e	2.286 TYP		
h	0.000	0.100	0.200
L	9.900	10.100	10.300
L1	2.888 REF		
L2	1.400	1.550	1.700
L3	1.600 REF		
L4	0.600	0.800	1.000
$\phi$	1.100	1.200	1.300
$\theta$	0°		8°
$\theta_1$	9° TYP		
$\theta_2$	9° TYP		

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