

- ★ Super Low Gate Charge
- ★ Green Device Available
- ★ Excellent Cdv/dt effect decline
- ★ Advanced high cell density Trench technology

## Product Summary



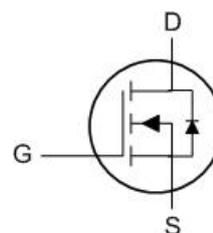
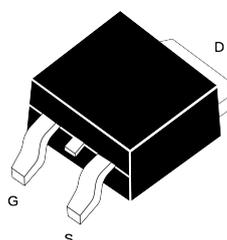
BVDSS	RDSON	ID
100V	95mΩ	12A

## Description

The JHS12N10 is the highest performance trench N-ch MOSFETs with extreme high cell density, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications .

The JHS12N10 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

## TO-252 Pin Configuration



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	100	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_A=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	12	A
$I_D@T_A=70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	3.2	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	11	A
$P_D@T_A=25^\circ C$	Total Power Dissipation <sup>3</sup>	1	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

## Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient <sup>1</sup>	---	125	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>	---	80	$^\circ C/W$

## Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise specified

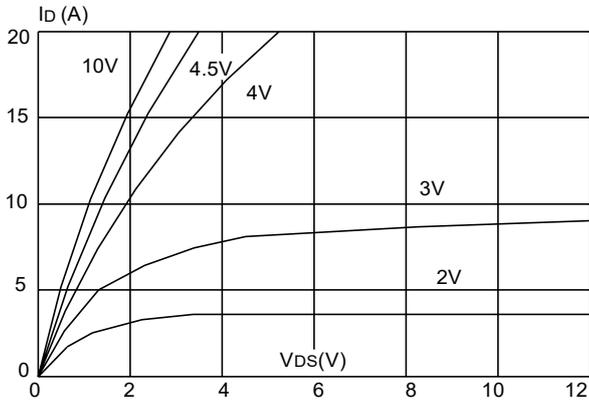
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	100	110	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 100V, V_{GS} = 0V$	-	-	1	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	$\pm 100$	nA
<b>On Characteristics</b> <sup>note3</sup>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.8	3.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance <sup>note2</sup>	$V_{GS} = 10V, I_D = 3A$	-	95	140	m $\Omega$
<b>Dynamic Characteristics</b> <sup>note4</sup>						
$C_{iss}$	Input Capacitance	$V_{DS} = 50V, V_{GS} = 0V,$ $f = 1.0MHz$	-	196	-	pF
$C_{oss}$	Output Capacitance		-	25.9	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	21.4	-	pF
$Q_g$	Total Gate Charge	$V_{DS} = 50V, I_D = 3A,$ $V_{GS} = 10V$	-	4.3	-	nC
$Q_{gs}$	Gate-Source Charge		-	3.5	-	nC
$Q_{gd}$	Gate-Drain("Miller") Charge		-	3.1	-	nC
<b>Switching Characteristics</b> <sup>note4</sup>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 50V, I_{DS}=3A$ $R_G = 2\Omega, V_{GEN} = 10V$	-	14.7	-	ns
$t_r$	Turn-On Rise Time		-	3.5	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	20.9	-	ns
$t_f$	Turn-Off Fall Time		-	2.7	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current <sup>note2</sup>	-	-	4.5	-	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current	-	-	12	-	A
$V_{SD}$	Drain to Source Diode Forward Voltage <sup>note3</sup>	$V_{GS} = 0V, I_S = 3A$	-	-	1.3	V
$t_{rr}$	Body Diode Reverse Recovery Time	$V_{GS} = 0V, I_F = 3A,$ $di/dt = 100A/\mu s$	-	32.1	-	ns
$Q_{rr}$	Body Diode Reverse Recovery Time Charge		-	39.4	-	nC
$I_{rrm}$	Peak Reverse Recovery Current		-	2.1	-	A

Notes:

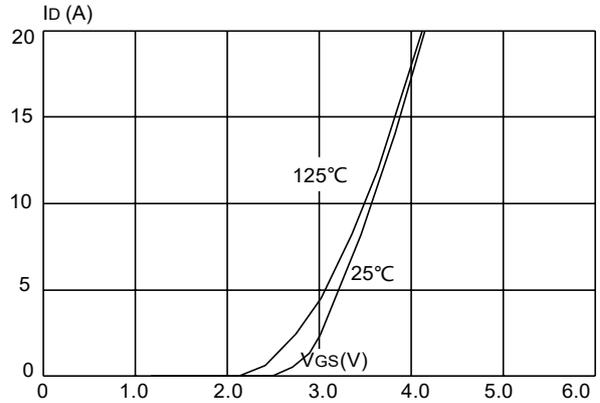
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production
5.  $V_{DD}=50$  V,  $R_G=50$   $\Omega$ ,  $L=0.3$  mH, starting  $T_J=25$   $^\circ\text{C}$

## Typical Performance Characteristics

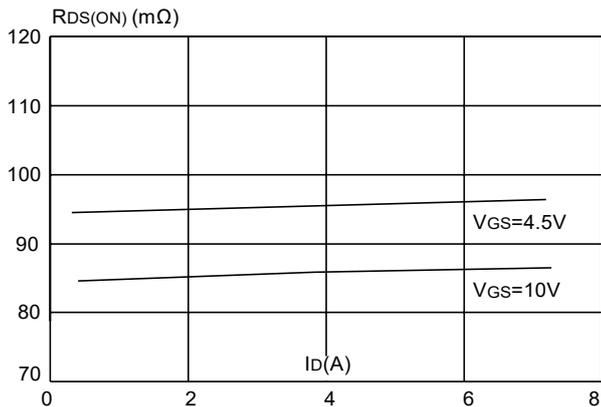
**Figure 1: Output Characteristics**



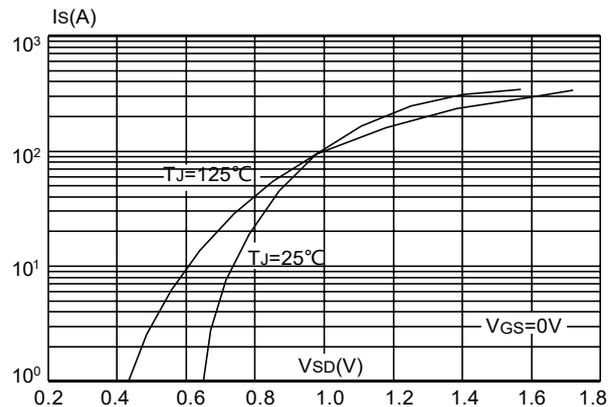
**Figure 2: Typical Transfer Characteristics**



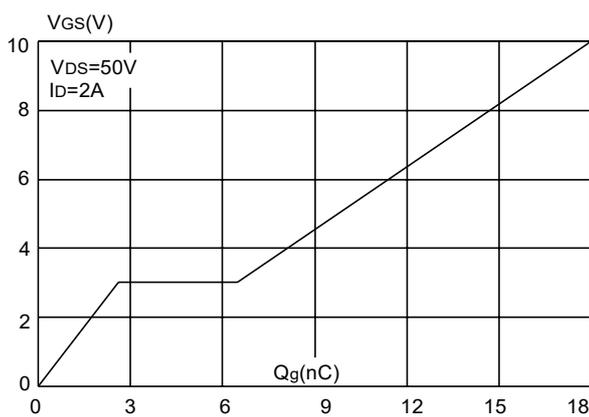
**Figure 3: On-resistance vs. Drain Current**



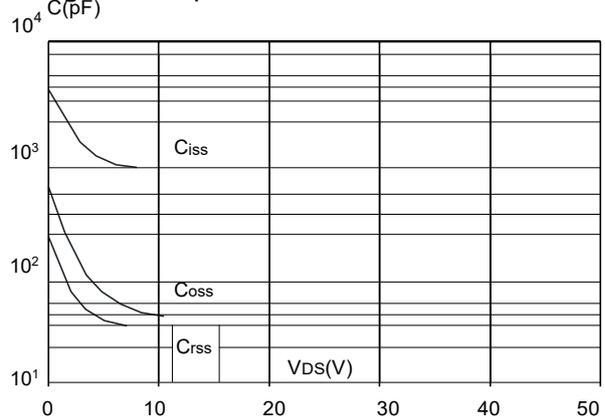
**Figure 4: Body Diode Characteristics**



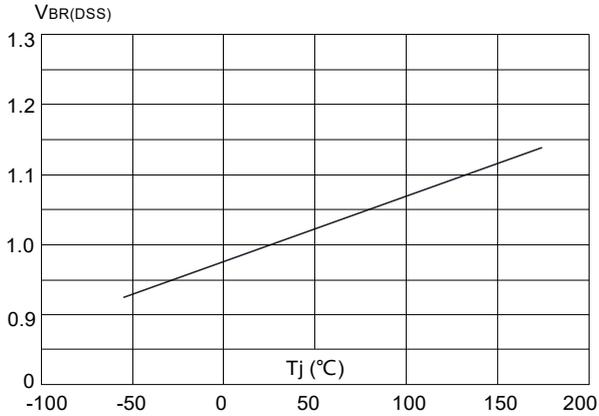
**Figure 5: Gate Charge Characteristics**



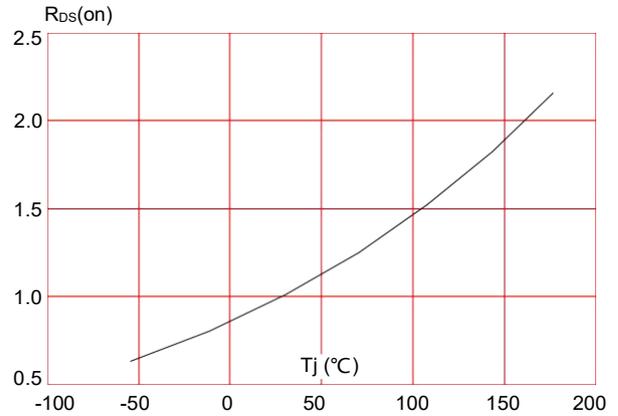
**Figure 6: Capacitance Characteristics**



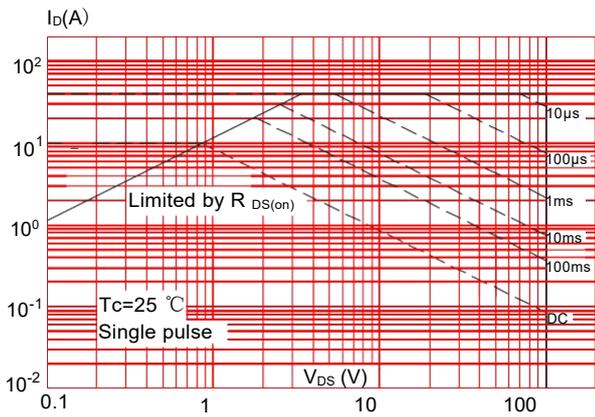
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



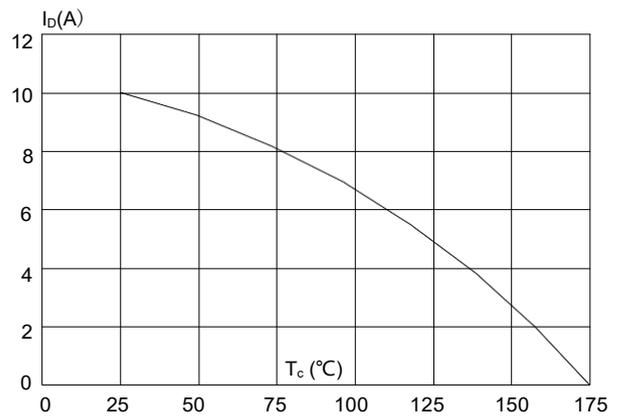
**Figure 8:** Normalized on Resistance vs. Junction Temperature



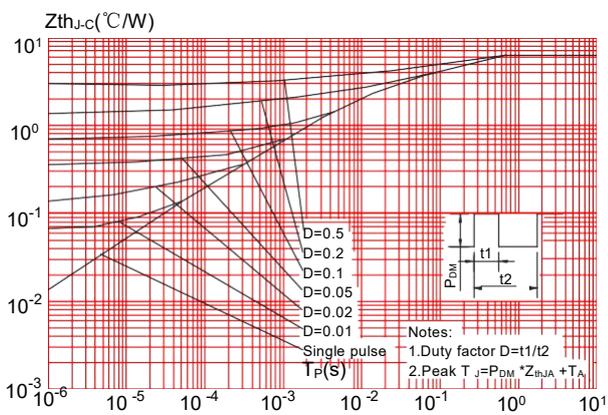
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature

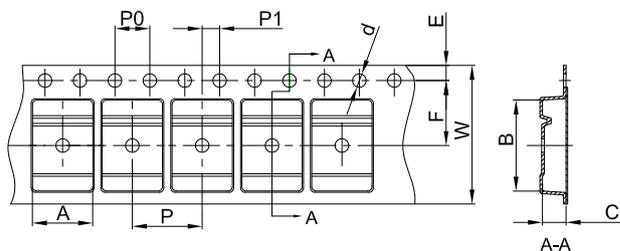


**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case



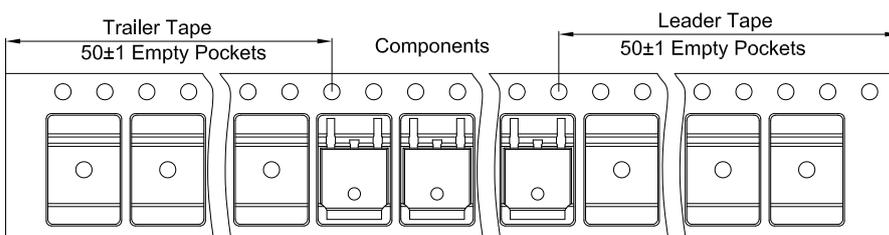
## TO-252-2L Tape and Reel

### TO-252 Embossed Carrier Tape

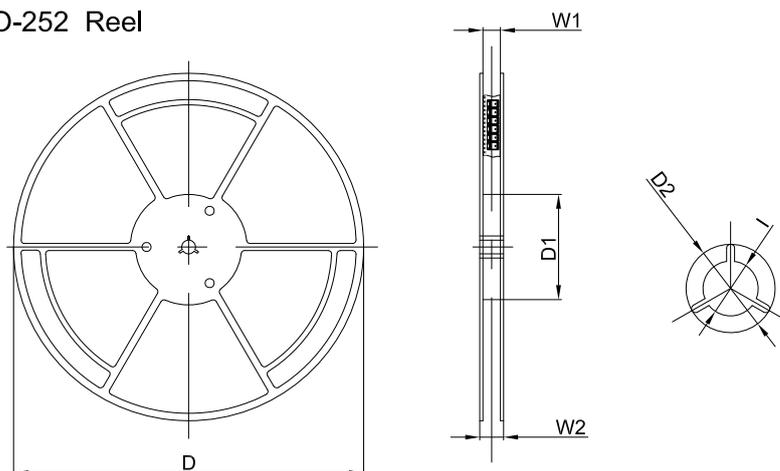


Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
TO-252	6.90	10.50	2.70	Ø1.55	1.75	7.50	4.00	8.00	2.00	16.00

### TO-252 Tape Leader and Trailer

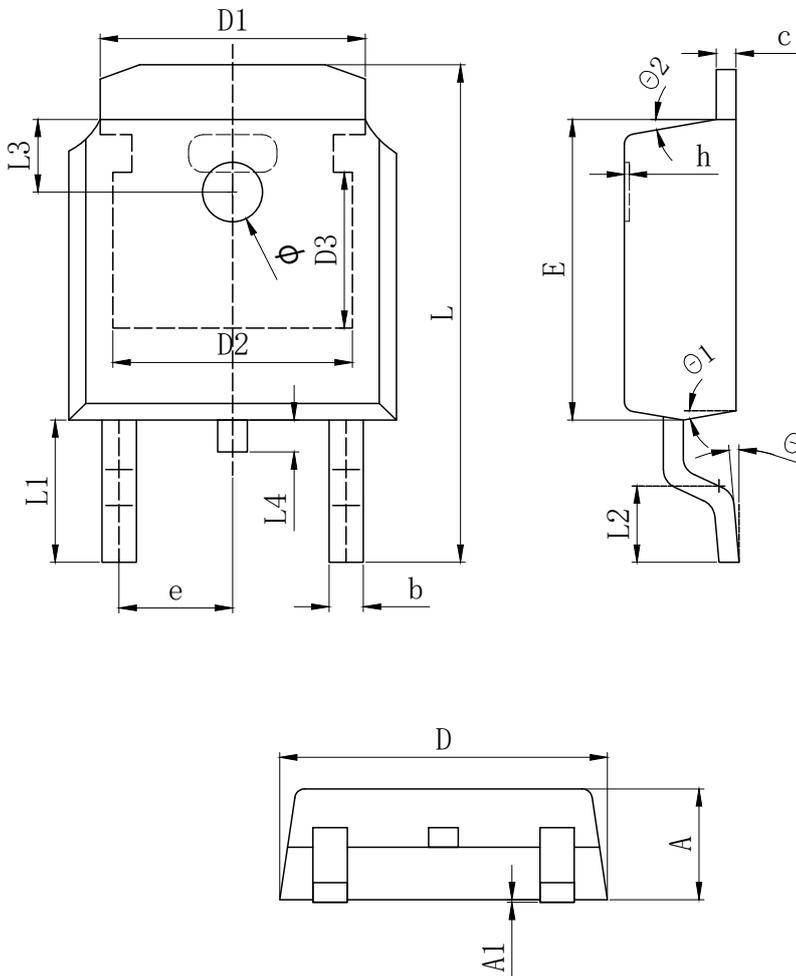


### TO-252 Reel



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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