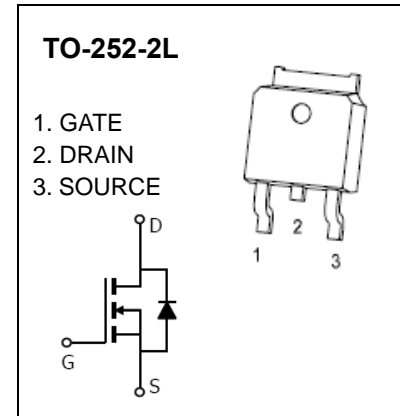


## TO-252-2L Plastic-Encapsulate MOSFETS

### **CJU04N60** 600V N-Channel Power MOSFET

#### General Description

This advanced high voltage MOSFET is designed to withstand high energy in the avalanche mode and switch efficiently. This new high energy device also offers a drain-to-source diode with fast recovery time. Designed for high voltage, high speed switching applications such as power supplies, converters, power motor controls and bridge circuits.



#### FEATURE

- High Current Rating
- Lower  $R_{ds(on)}$
- Lower Capacitance
- Lower Total Gate Charge
- Tighter VSD Specifications
- Avalanche Energy Specified

#### Maximum ratings ( $T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	600	V
Gate-Source Voltage	$V_{GSS}$	$\pm 30$	
Continuous Drain Current	$I_D$	4.0	A
Continuous Drain-Source Diode Forward Current	$I_S$	4.0	
Single Pulsed Avalanche Energy (note1)	$E_{AS}$	260	mJ
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	100	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 ~ +150	$^\circ\text{C}$
Maximum lead temperature for soldering purposes , 1/8" from case for 5 seconds	$T_L$	260	

**Electrical characteristics (T<sub>a</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Off characteristics</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	600			V
Drain-source diode forward voltage(note2)	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> =4.0A			1.5	
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =600V, V <sub>GS</sub> =0V			25	μA
Gate-body leakage current, forward(note2)	I <sub>GSSF</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =30V			100	nA
Gate-body leakage current, reverse(note2)	I <sub>GSSR</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =-30V			-100	
<b>On characteristics (note2)</b>						
Gate-threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0		4.0	V
Static drain-source on-resistance	R <sub>DSON</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =2.0A		2.0	3.0	Ω
Forward transconductance	g <sub>fs</sub>	V <sub>DS</sub> =50V, I <sub>D</sub> =2A	2.0	2.6		S
<b>Dynamic characteristics (note 3)</b>						
Input capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f =1MHz		540	760	pF
Output capacitance	C <sub>OSS</sub>			125	180	
Reverse transfer capacitance	C <sub>rss</sub>			8.0	20	
<b>Switching characteristics</b>						
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> =480V, V <sub>GS</sub> =10V, I <sub>D</sub> =4.0A		5.0	10	nC
Gate-source charge	Q <sub>gs</sub>			2.7		
Gate-drain charge	Q <sub>gd</sub>			2.0		
Turn-on delay time (note3)	t <sub>d(on)</sub>	V <sub>DD</sub> =300V, V <sub>GS</sub> =10V, R <sub>G</sub> =9.1Ω, I <sub>D</sub> =4.0A		12	20	ns
Turn-on rise time (note3)	t <sub>r</sub>			7.0	10	
Turn-off delay time (note3)	t <sub>d(off)</sub>			19	40	
Turn-off fall time (note3)	t <sub>f</sub>			10	20	

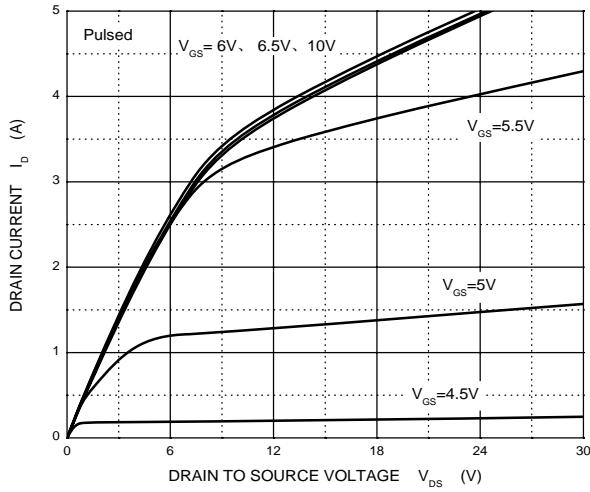
**Notes :**

1. L=30mH, I<sub>L</sub>=4 A, V<sub>DD</sub>=100V, V<sub>GS</sub>=10V, R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C.
2. Pulse Test : Pulse width≤300μs, duty cycle ≤2%.
3. These parameters have no way to verify.

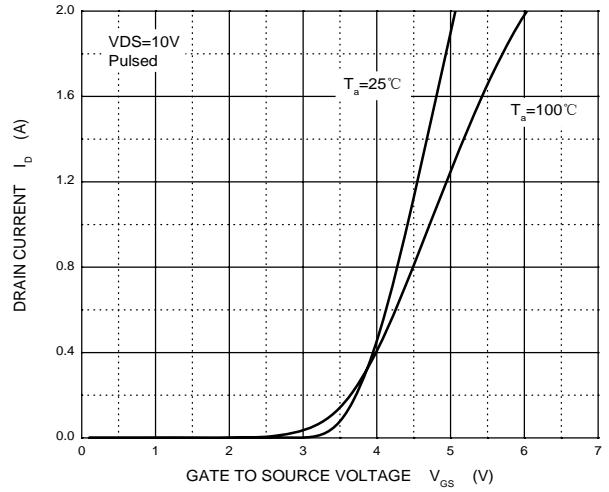
# Typical Characteristics

# CJU04N60

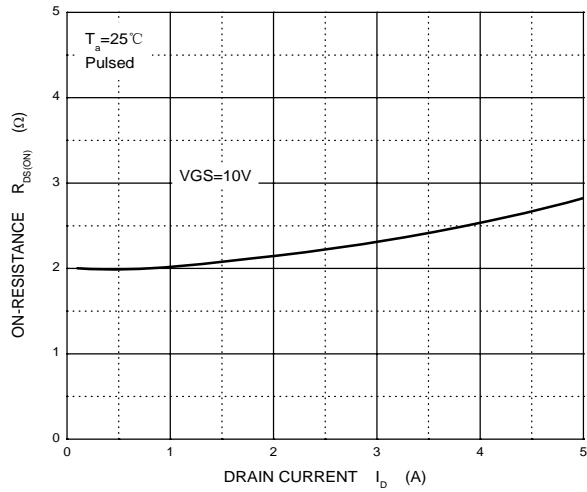
Output Characteristics



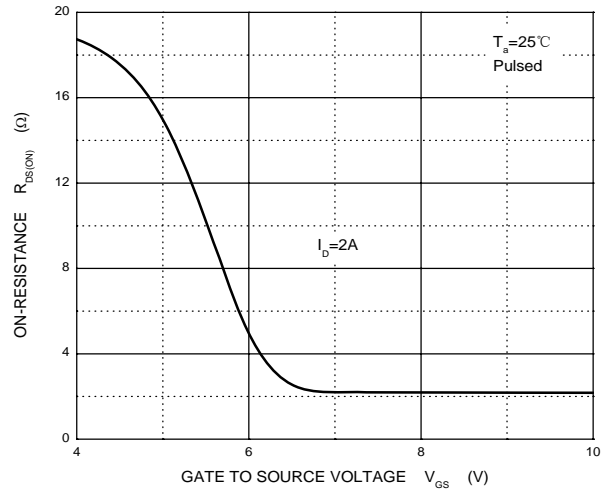
Transfer Characteristics



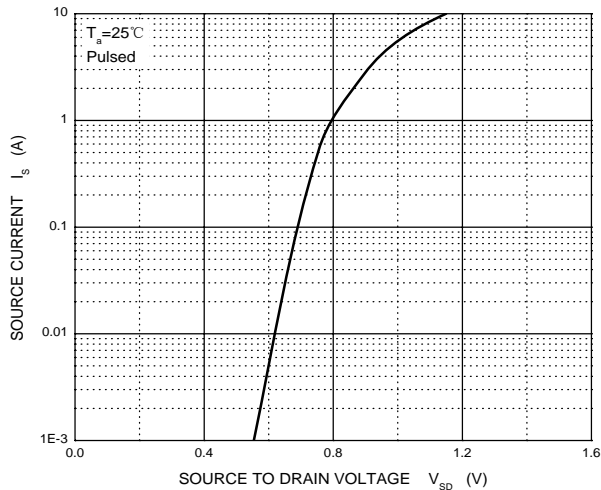
$R_{DS(ON)}$  —  $I_D$



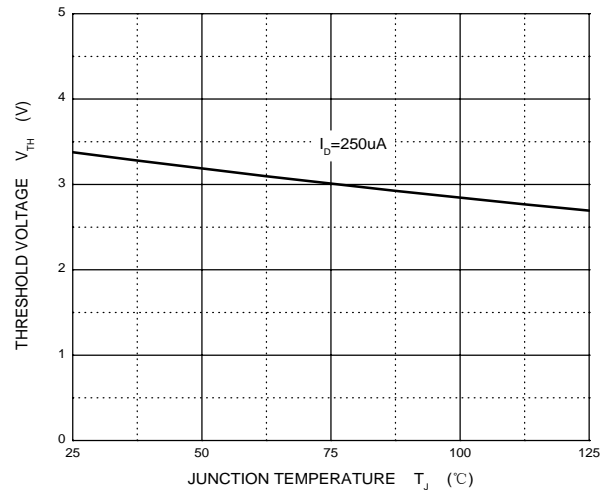
$R_{DS(ON)}$  —  $V_{GS}$



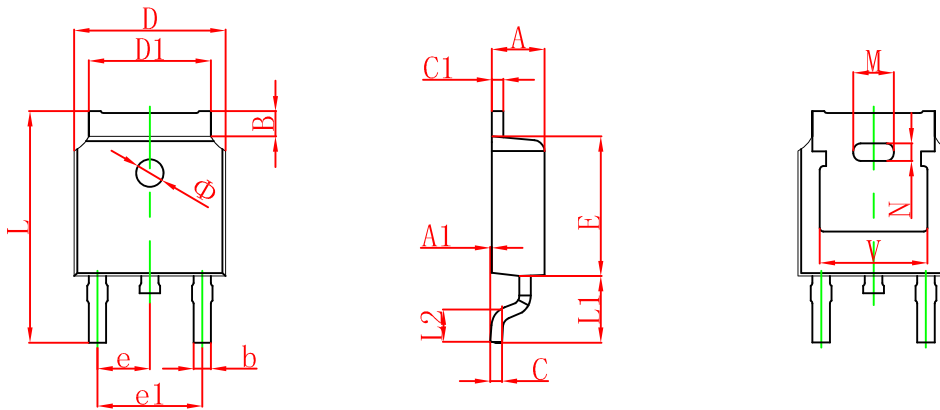
$I_S$  —  $V_{SD}$



Threshold Voltage

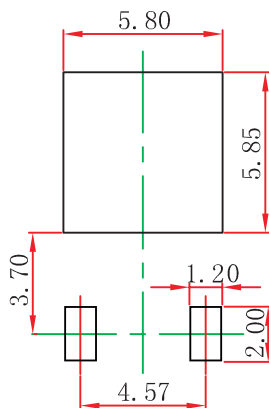


## TO-252(4R)-2L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.380	0.087	0.094
A1	0.000	0.100	0.000	0.004
B	0.800	1.400	0.031	0.055
b	0.710	0.810	0.028	0.032
c	0.460	0.560	0.018	0.022
c1	0.460	0.560	0.018	0.022
D	6.500	6.700	0.256	0.264
D1	5.130	5.460	0.202	0.215
E	6.000	6.200	0.236	0.244
e	2.286 TYP.		0.090 TYP.	
e1	4.327	4.727	0.170	0.186
M	1.778REF.		0.070REF.	
N	0.762REF.		0.018REF.	
L	9.800	10.400	0.386	0.409
L1	2.9REF.		0.114REF.	
L2	1.400	1.700	0.055	0.067
V	4.830 REF.		0.190 REF.	
Φ	1.100	1.300	0.043	0.051

## TO-252(4R)-2L Suggested Pad Layout



### Note:

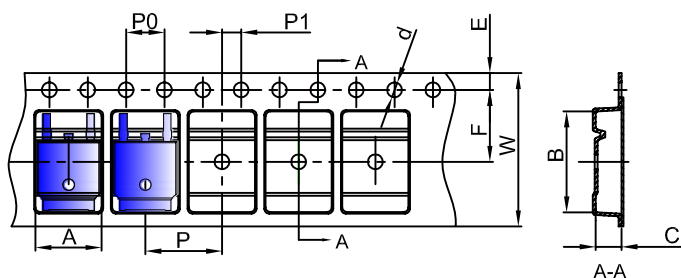
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

### NOTICE

JCET reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. JCET does not assume any liability arising out of the application or use of any product described herein.

## TO-252 Tape and reel

### TO-252 Embossed Carrier Tape

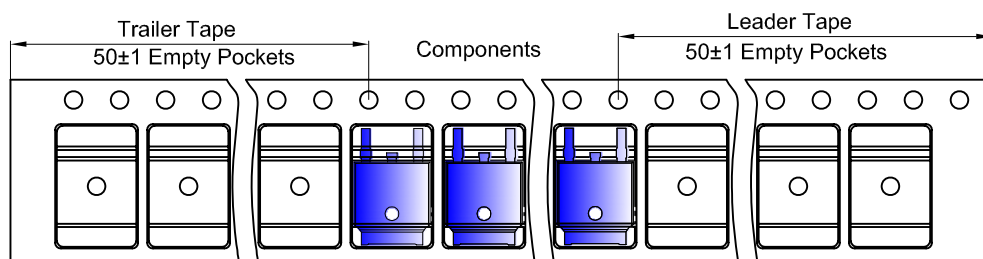


#### Packaging Description:

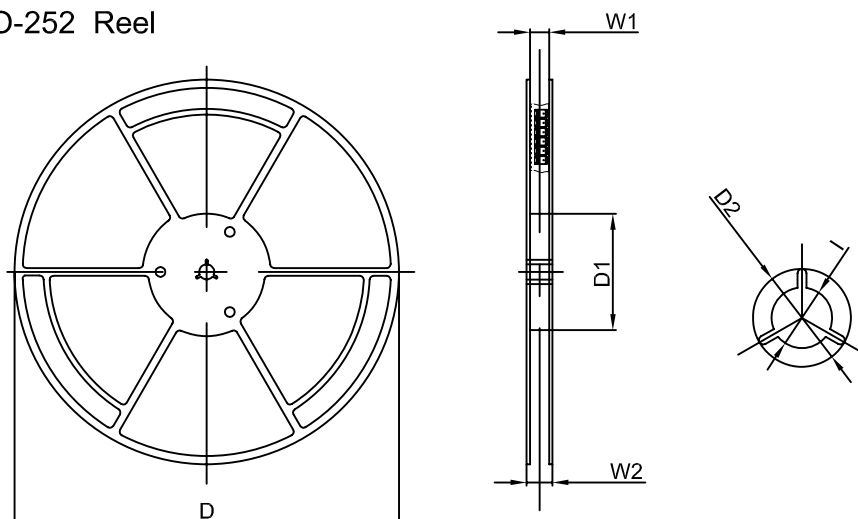
TO-252 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 25,00 units per 13" or 33.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

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
(Tolerance)	+/-0.1	+/-0.1	+/-0.1	+/-0.1	+/-0.1	+/-0.1	+/-0.1	+/-0.1	+/-0.1	+0.3/-0.1

### 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
Tolerance	+/-2	+/-1	+/-1	+/-1	+/-1	+/-1

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	14.04