

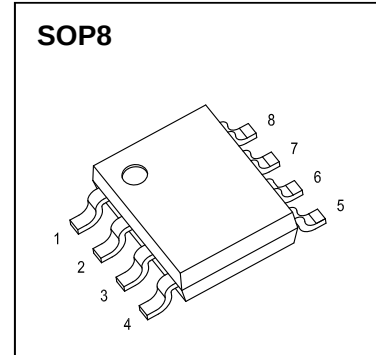


JIANGSU CHANGJING ELECTRONICS TECHNOLOGY CO., LTD

SOP8 Plastic-Encapsulate MOSFETS

CJQ13N04 N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$ TYP	I_D
40V	9.7m Ω @10V	13A
	12.7m Ω @4.5V	



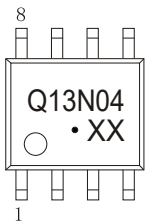
DESCRIPTION

The CJQ13N04 combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications

APPLICATIONS

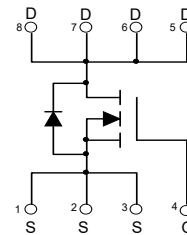
- Battery protection applications
- Load switch

MARKING



Q13N04 = Device code
Solid dot = Green molding compound device,
if none, the normal device
XX = Code

Equivalent Circuit



MAXIMUM RATINGS ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D ①	13	A
Pulsed Drain Current	I_{DM} ②	52	A
Single Pulsed Avalanche Energy	E_{AS} ③	42	mJ
Power Dissipation	P_D ⑥	3.0	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$ ⑥	41.7	$^{\circ}\text{C/W}$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	$^{\circ}\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS

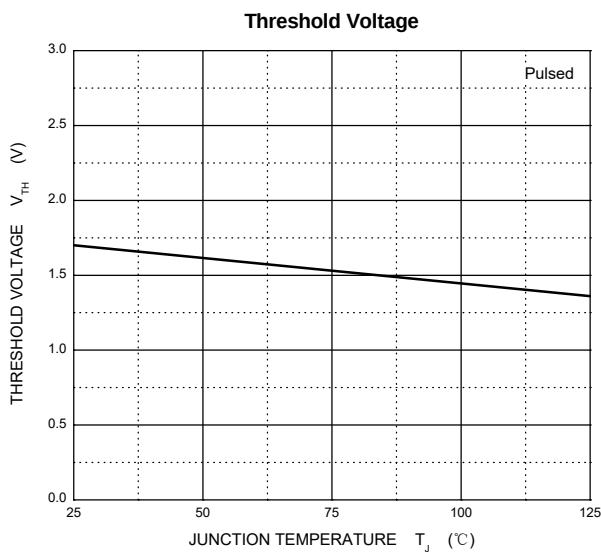
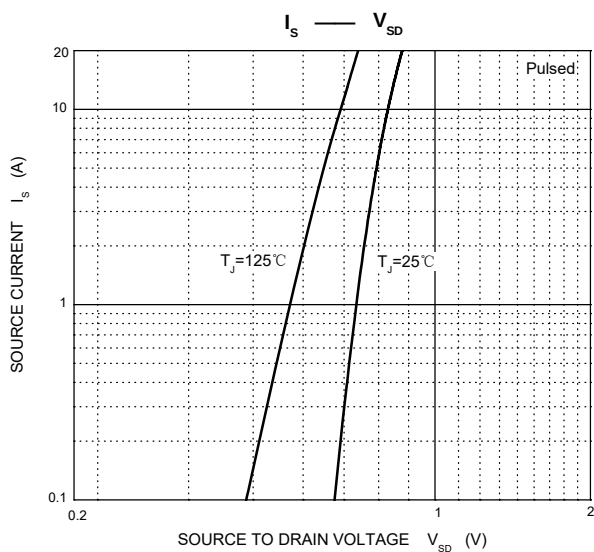
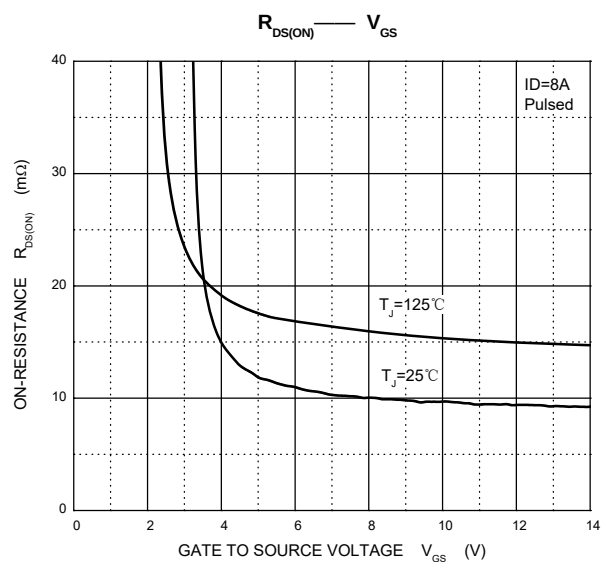
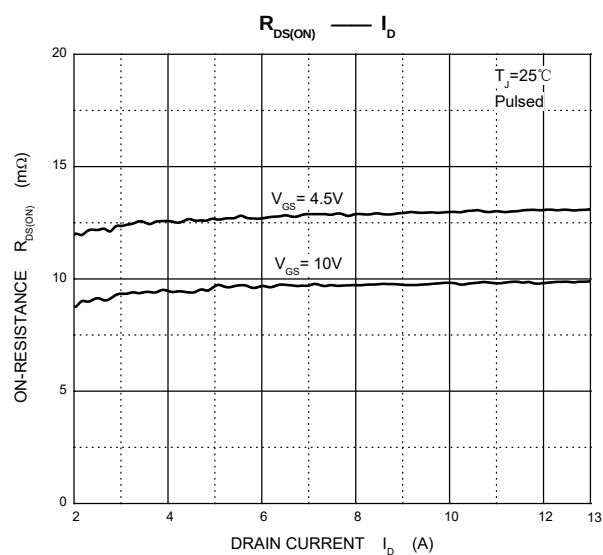
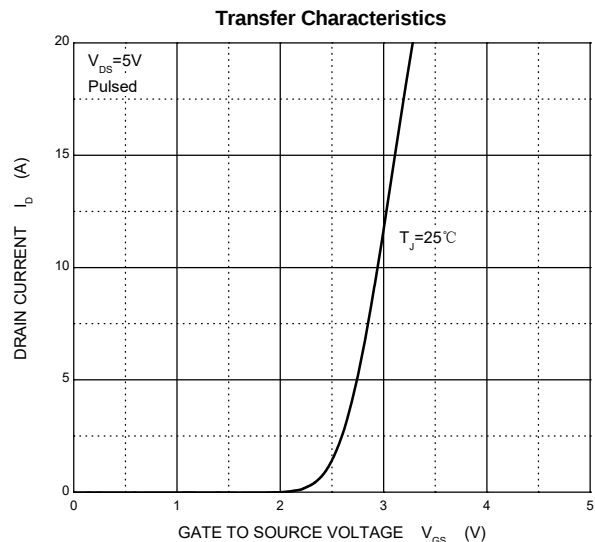
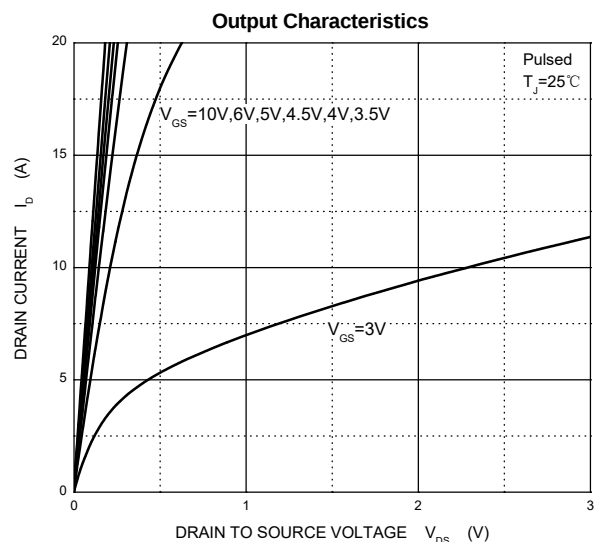
$T_a=25^{\circ}\text{C}$ unless otherwise specified

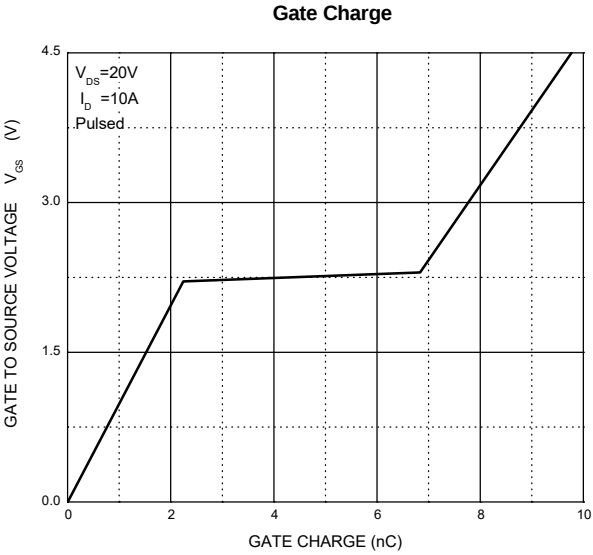
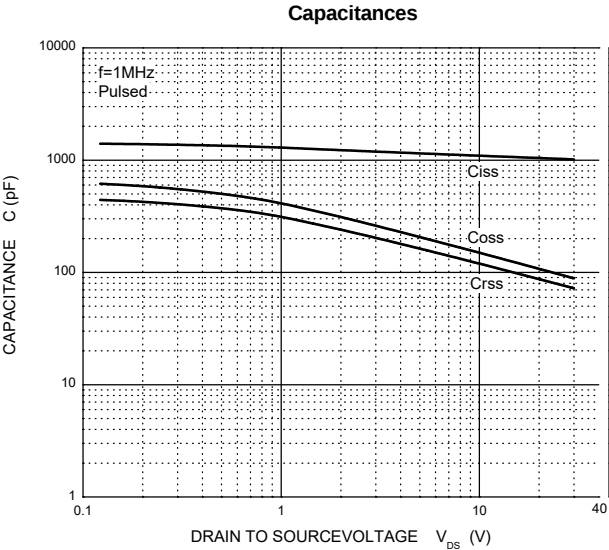
Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Off characteristics							
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D =250μA		40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =32V,	T _J =25 ℃			1.0	μA
		V _{GS} =0V	T _J =125 ℃			100	
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V				±100	nA
On characteristics ④							
Gate-threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA		1.2	1.7	2.5	V
Static drain-source on-sate resistance	R _{DS(on)}	V _{GS} =10V, I _D =8A			9.7	12	mΩ
		V _{GS} =4.5V, I _D =6A			12.7	17	mΩ
Dynamic characteristics ④ ⑤							
Input capacitance	C _{iss}	V _{DS} =20V,V _{GS} =0V, f =1MHz			1043	2000	pF
Output capacitance	C _{oss}				108	200	
Reverse transfer capacitance	C _{rss}				84	160	
Gate resistance	R _g	f =1MHz			4.2		Ω
Switching characteristics ④ ⑤							
Total gate charge	Q _g	V _{GS} =4.5V, V _{DS} =20V, I _D =10A			9.9	20	nC
Gate-source charge	Q _{gs}				2.3	5.0	
Gate-drain charge	Q _{gd}				4.7	9.4	
Turn-on delay time	t _{d(on)}	V _{DS} =20V,I _D =1A V _{GS} =10V,R _G =6Ω			8.0		ns
Turn-on rise time	t _r				3.2		
Turn-off delay time	t _{d(off)}				26.4		
Turn-off fall time	t _f				3.8		
Drain-Source Diode Characteristics							
Drain-source diode forward voltage	V _{SD} ④	V _{GS} =0V, I _S =1A				1.2	V
Continuous drain-source diode forward current	I _S ①					13	A
Pulsed drain-source diode forward current	I _{SM} ②					52	A

Notes:

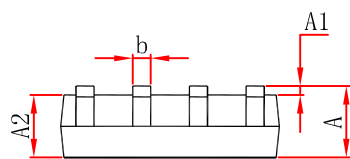
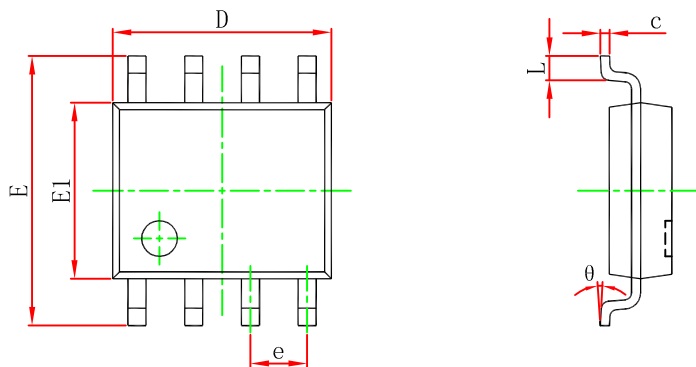
1. $T_C=25^{\circ}\text{C}$ Limited only by maximum temperature allowed.
2. $P_W \leq 10\mu s$, Duty cycle $\leq 1\%$.
3. EAS condition: $V_{DD}=30V, V_{GS}=10V, L=0.1mH, R_g=25\Omega$ Starting $T_J=25^{\circ}\text{C}$.
4. Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
5. Guaranteed by design, not subject to production.
6. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a=25^{\circ}\text{C}, t \leq 10\text{sec}$.

Typical Characteristics



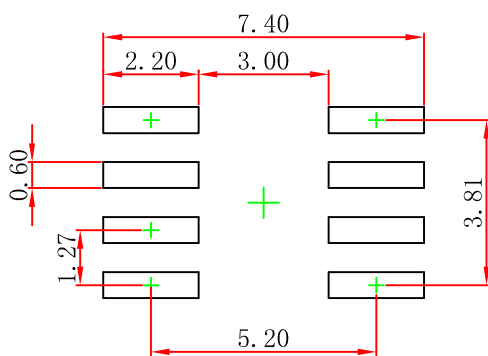


SOP8 Package Outline Dimensions



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°

SOP8 Suggested Pad Layout



Note:

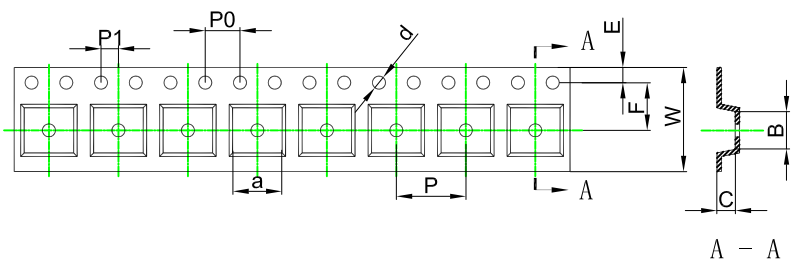
1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

NOTICE

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

SOP8 Tape and Reel

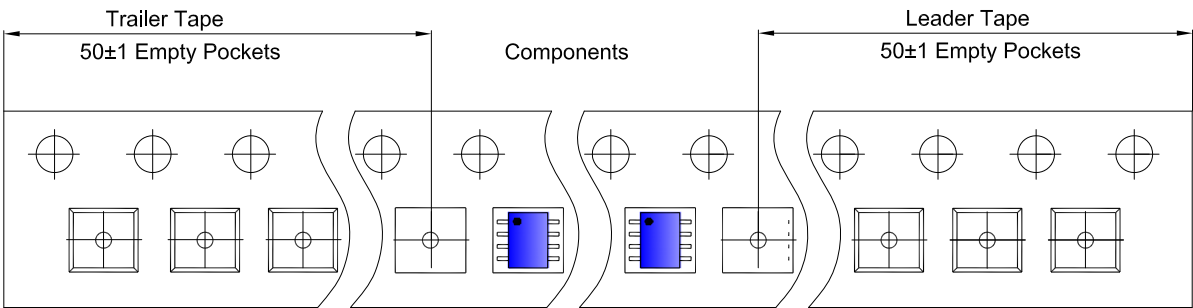
SOP8 Embossed Carrier Tape



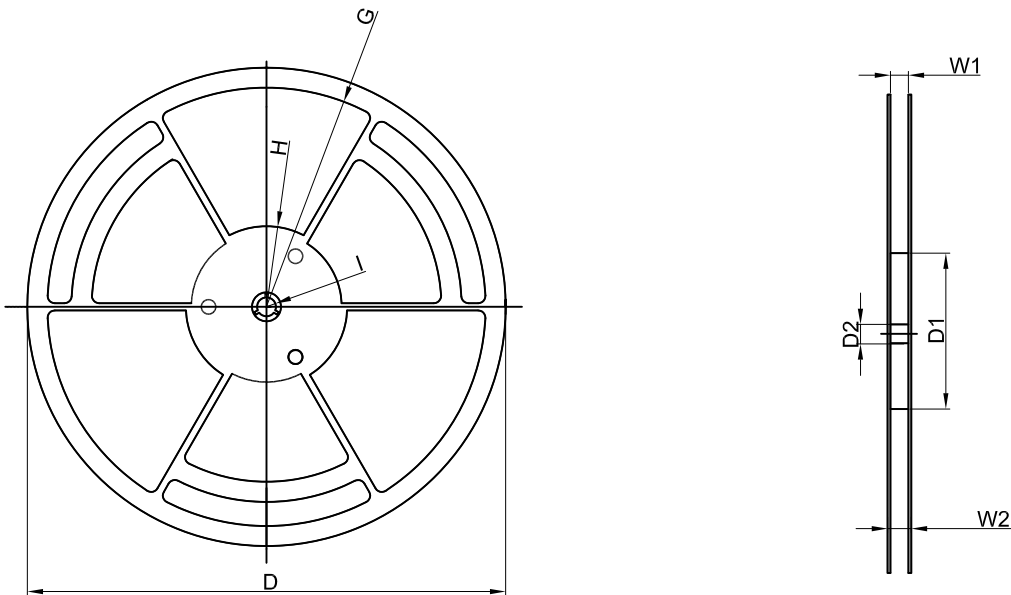
Packaging Description:
SOP8 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 2,500 units per 13" or 33cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).
ALL DIM IN mm

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

SOP8 Tape Leader and Trailer



SOP8 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)
4,000 pcs	13 inch	8,000 pcs	360×360×65	64,000 pcs	565×380×390	