

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
30V	12mΩ@10V	10A
	16mΩ@4.5V	

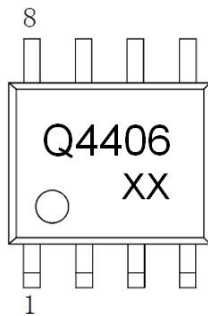
### Feature

- High cell density trench N-ch MOSFETs
- Super low gate charge
- Advanced high cell density Trench technology

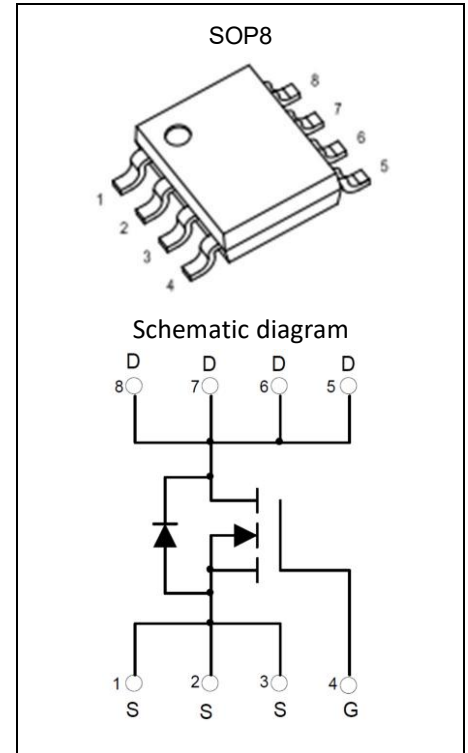
### Application

- Battery protection applications
- Load switch

### MARKING:



Q4406= Device code  
 Solid dot=Pin1 indicator  
 Solid dot = Green molding compound device,  
 if none, the normal device  
 YY=Date Code



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	10	A
Pulsed Drain Current	$I_{DM}$	40	A
Single Pulse Avalanche Energy	$E_{AS}^{(1)}$	100	mJ
Power Dissipation	$P_D$	1.4	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	89	$^\circ\text{C/W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55~ +150	$^\circ\text{C}$

(1). $E_{AS}$  condition:  $V_{DD}=-50\text{V}$ ,  $L=0.5\text{mH}$ ,  $R_G=25\Omega$ , Starting  $T_J = 25^\circ\text{C}$

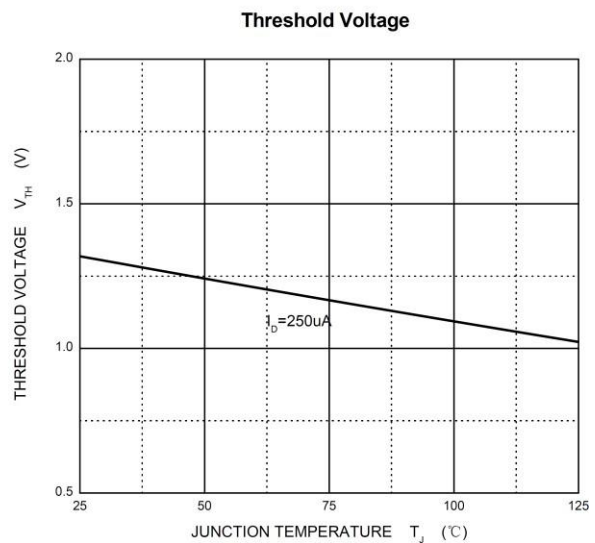
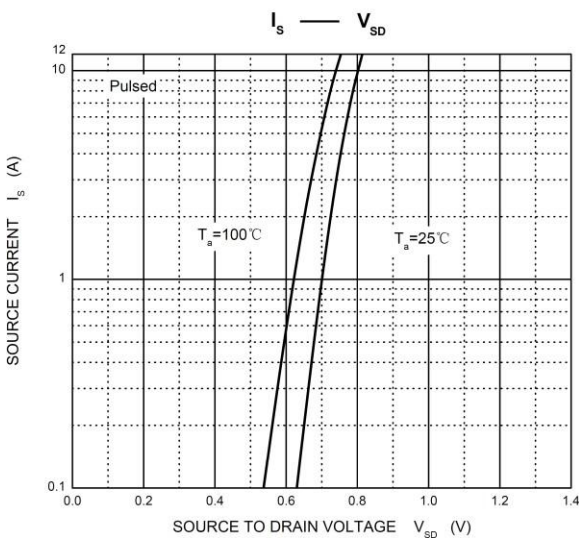
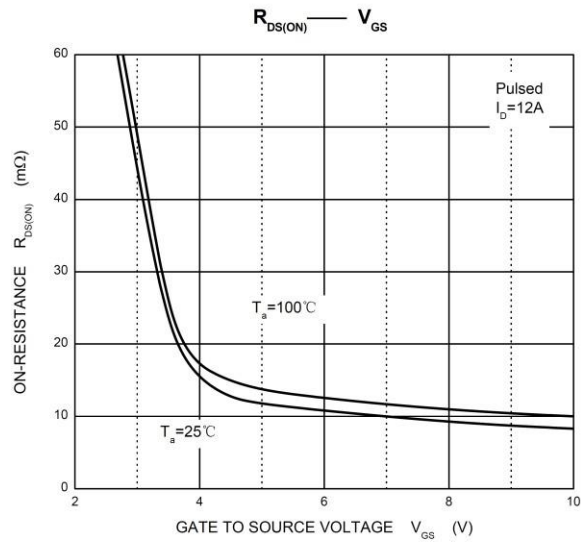
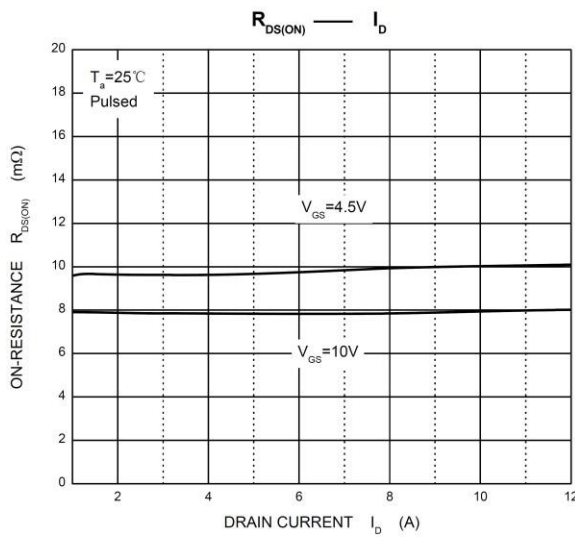
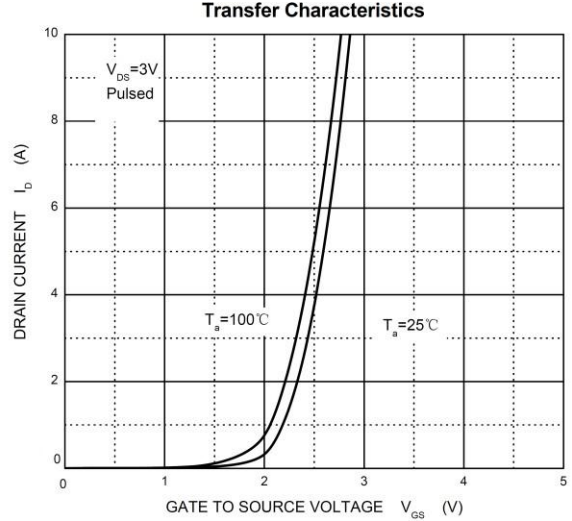
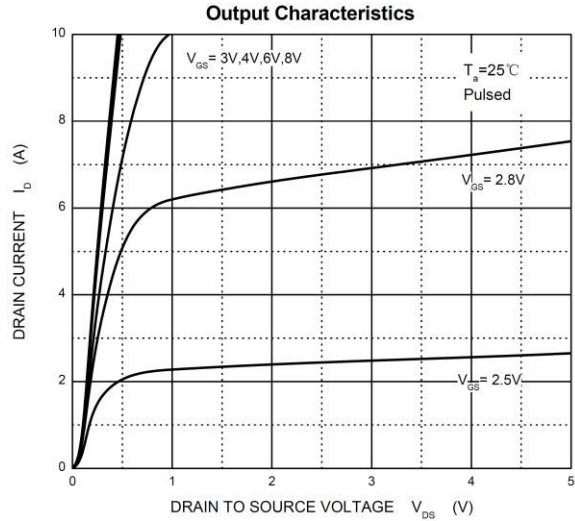
**MOSFET ELECTRICAL CHARACTERISTICS (T<sub>J</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Type	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	30			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V			-1	μA
Gate-body leakage current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
Gate threshold voltage <sup>1</sup>	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.0	1.35	3.0	V
Drain-source on-resistance <sup>1</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 12A		8	12	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 10A		10	16	
Forward transconductance <sup>1</sup>	g <sub>FS</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 10A	10	14		S
<b>Dynamic characteristics<sup>2</sup></b>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 0V, f = 1MHz		1570		pF
Output capacitance	C <sub>oss</sub>			320		
Reverse transfer capacitance	C <sub>rss</sub>			190		
<b>Switching Characteristics<sup>2</sup></b>						
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> = 15V, V <sub>GS</sub> = 5V, I <sub>D</sub> = 10A		13.5		nC
Gate-source charge	Q <sub>gs</sub>			5.6		
Gate-drain charge	Q <sub>gd</sub>			3.7		
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = 25V, V <sub>GS</sub> = 10V, R <sub>G</sub> = 63Ω, R <sub>L</sub> = 6.7Ω, I <sub>D</sub> = 1A		31		ns
Turn-on rise time	t <sub>r</sub>			22		
Turn-off delay time	t <sub>d(off)</sub>			105		
Turn-off fall time	t <sub>f</sub>			82		
<b>Diode Characteristics</b>						
Continuous Source Current	I <sub>S</sub>	V <sub>G</sub> = V <sub>D</sub> = 0V, Force Current			10	A
Pulsed Source Current	I <sub>SM</sub>				40	
Diode Forward Voltage <sup>1</sup>	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> = 10A, T <sub>J</sub> = 25°C		0.8	1.2	V

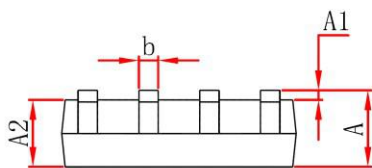
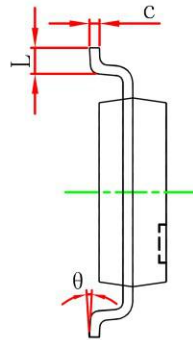
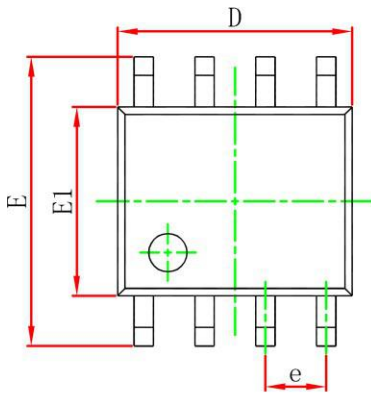
Notes:

1. Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.

## Typical Electrical and Thermal Characteristics



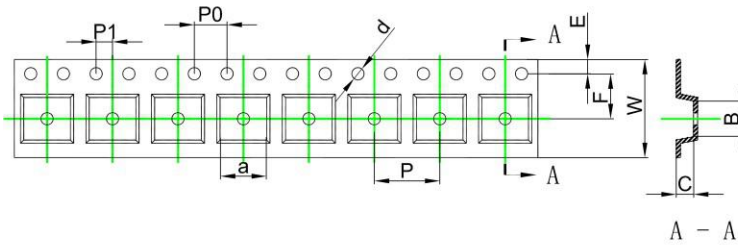
## SOP8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	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	4.800	5.000	0.189	0.197
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
$\theta$	0°	8°	0°	8°

## SOP8 Tape and Reel

### SOP8 Embossed Carrier Tape



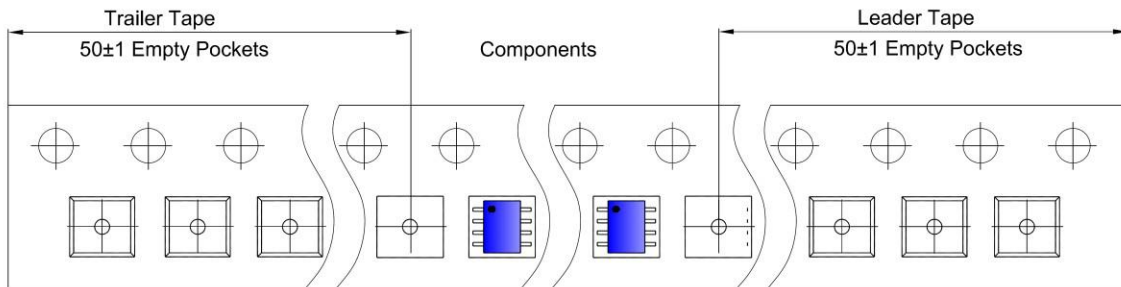
**Packaging Description:**

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).

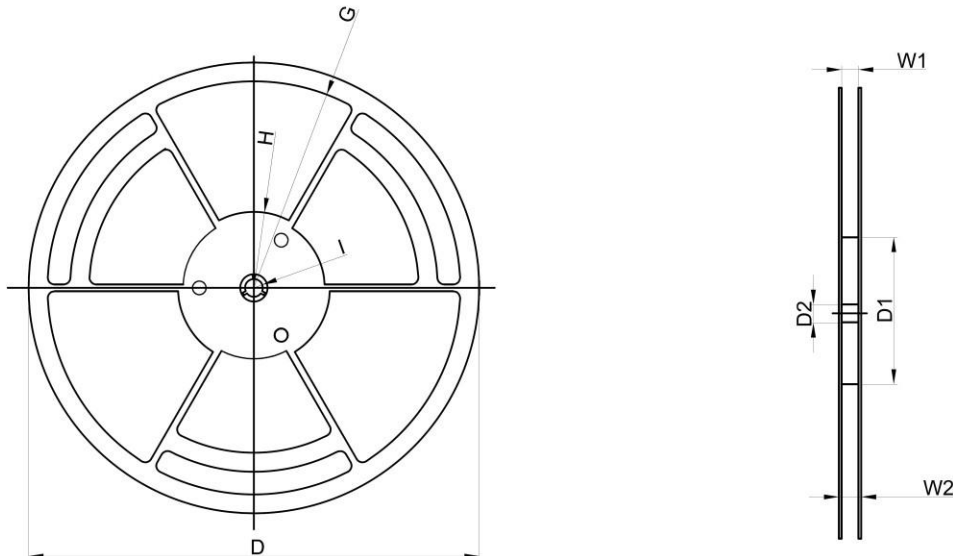
ALL DIM IN mm

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	