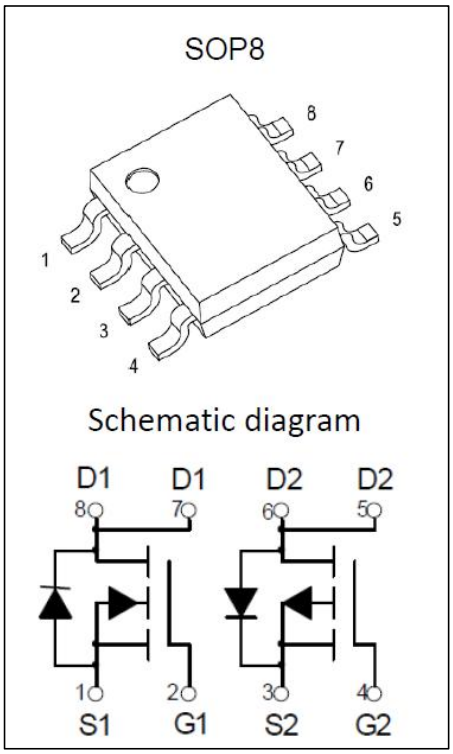
CHONGQING CLOUDCHILD TECHNOLOGY CO., LTD

SOP8 Plastic-Encapsulate MOSFETS

CC20NP45Q N+P-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-20V	29mΩ@-4.5V	-6A
	39mΩ@-2.5V	
	62mΩ@-1.8V	
20V	13mΩ@4.5V	10A
	16mΩ@2.5V	
	24mΩ@1.8V	



FEATURES

- Low drain-source ON-resistance
- High forward transfer admittance
- Low leakage current
- AEC Q101 Qualified

APPLICATIONS

- Low voltage applications

MARKING

20NP45 = Device Code

XX = Date Code

Solid dot = Green Device

ABSOLUTE MAXIMUM RATINGS(T_c=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
P-MOSFET			
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current(1)	I_D	-6	A
Pulsed Drain Current	I_{DM}	-24	A
Power Dissipation	P_D	1.4	W
N-MOSFET			
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current	I_D	10	A
Pulsed Drain Current(1)	I_{DM}	40	A
Power Dissipation	P_D	1.7	W
Temperature and Thermal Resistance			
Thermal Resistance from Junction to Ambient(2)	$R_{\theta JA}$	89	℃/W
Junction Temperature	T_J	175	℃
Storage Temperature	T_{STG}	-55~ +175	℃

P-channel MOSFET ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-20			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-16V,V_{GS} = 0V			-1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±12V, V_{DS} = 0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-0.4	-0.7	-1.0	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =-4.5V, I_D =-3.0A		29	38	mΩ
		V_{GS} =-2.5V, I_D =-3.0A		39	53	
		V_{GS} =-1.8V, I_D =-2.0A		62	83	
Forward tranconductance	g_{FS}	V_{DS} =-5V, I_D =-6.0A	6			S
Diode forward voltage(3)	V_{DS}	I_S=-6.0A, V_{GS} = 0V			-1.2	V
Dynamic characteristics(4)						
Input Capacitance	C_{iss}	V_{DS} =-6V,V_{GS} =0V,f =1MHz		715		pF
Output Capacitance	C_{oss}			170		
Reverse Transfer Capacitance	C_{rss}			120		
Total gate charge	Q_g	V_{DS} =-6V,V_{GS} =-4.5V,I_D=-3.3A			13	nC
Gate-source charge	Q_{gs}			1.2		
Gate-drain charge	Q_{gd}			1.6		
Switching Characteristics(4)						
Turn-on delay time	$t_{d(on)}$	V_{GEN}=-4.5V,V_{DD}=-6V, I_D =-1.0A,R_G=6Ω, R_L=6Ω			25	nS
Turn-on rise time	t_r				55	
Turn-off delay time	$t_{d(off)}$				90	
Turn-off fall time	t_f				60	

N-channel MOSFET ELECTRICAL CHARACTERISTICS(T_a=25℃ unless otherwise noted)

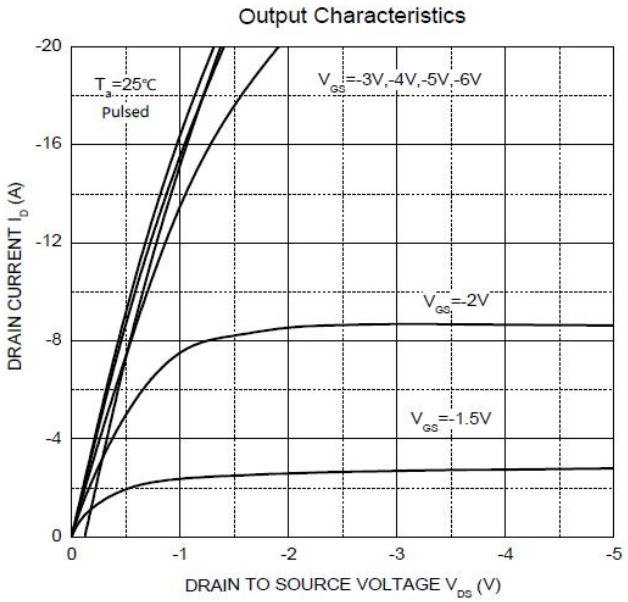
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	20			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =16V,V_{GS} = 0V			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±12V, V_{DS} = 0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	0.4	0.7	1	V
Drain-source on-resistance(3)	$R_{DS(on)}$	V_{GS} =4.5V, I_D =5.0A		13	17	mΩ
		V_{GS} =2.5V, I_D =5.0A		16	25	
		V_{GS} =1.8V, I_D =4.0A		24	32	
Forward tranconductance	g_{FS}	V_{DS} =10V, I_D =5A	6			S
Diode Forward voltage(3)	V_{DS}	I_S=10A, V_{GS} = 0V			1.2	V
Dynamic characteristics(4)						
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}=0V, F=1.0MHz		865		pF
Output Capacitance	C_{oss}			105		
Reverse Transfer Capacitance	C_{rss}			55		
Total gate charge	Q_g	V_{DS}=10V,I_D=10A,V_{GS}=4.5V		12		nC
Gate-source charge	Q_{gs}			1.5		
Gate-drain charge	Q_{gd}			4.0		
Switching Characteristics(4)						
Turn-on delay time	$t_{d(on)}$	V_{GEN}=5V,V_{DD}=10V, I_D =4A,R_G=1Ω, R_L=2.2Ω			10	ns
Turn-on rise time	t_r				20	
Turn-off delay time	$t_{d(off)}$				32	
Turn-off fall time	t_f				12	

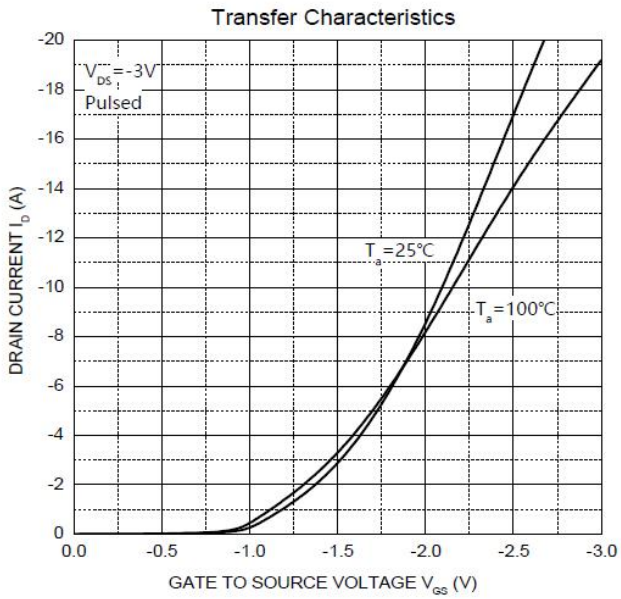
Notes:

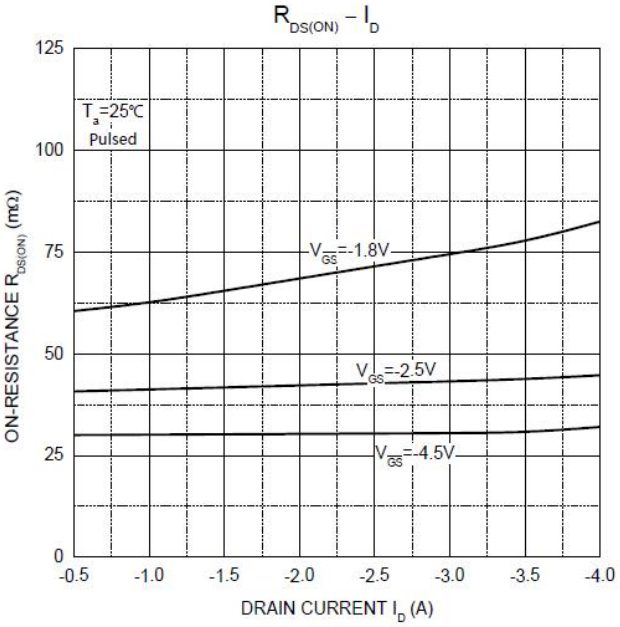
1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 5 sec.
3. Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

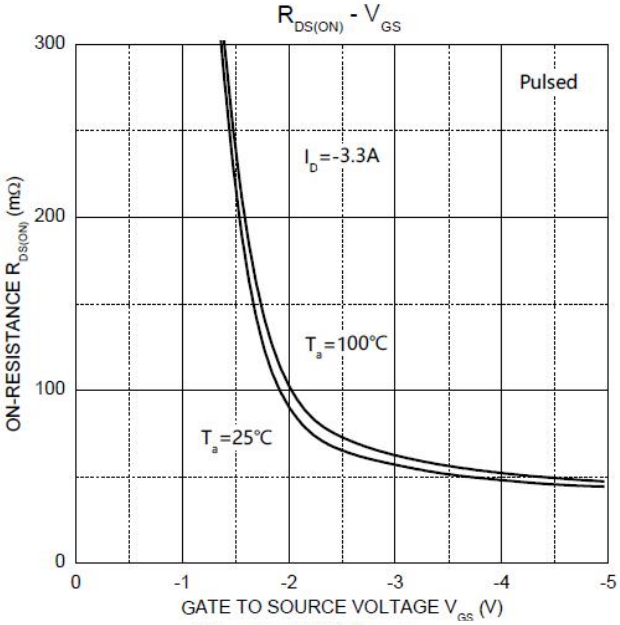
Typical Electrical and Thermal Characteristics

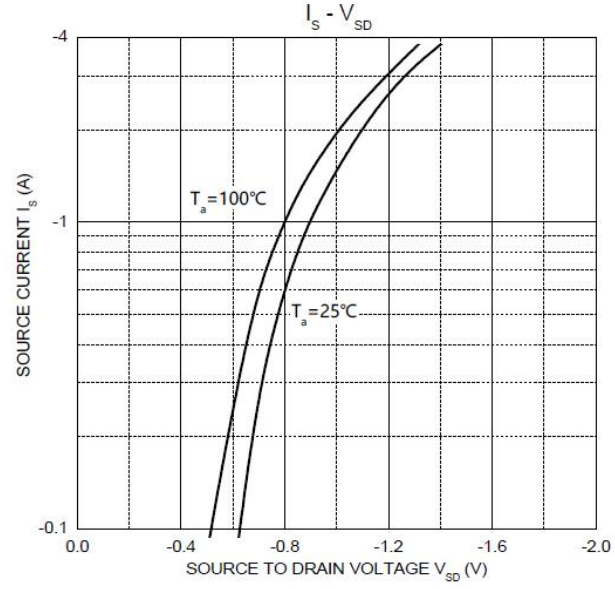
P-Channel MOS

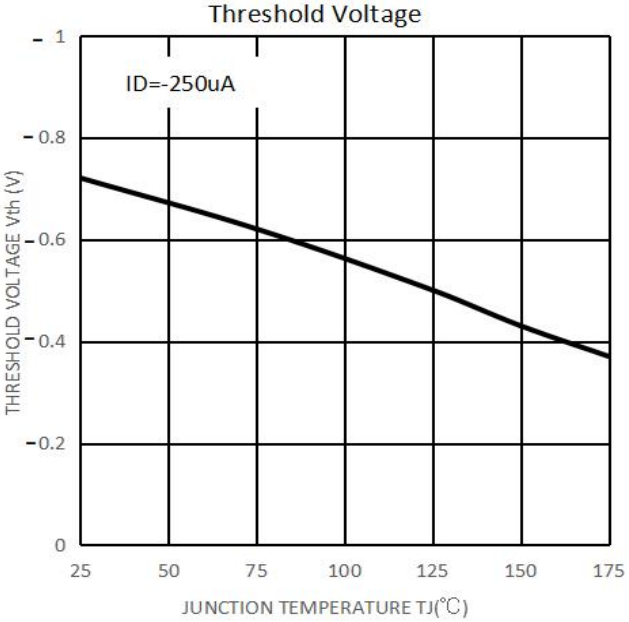




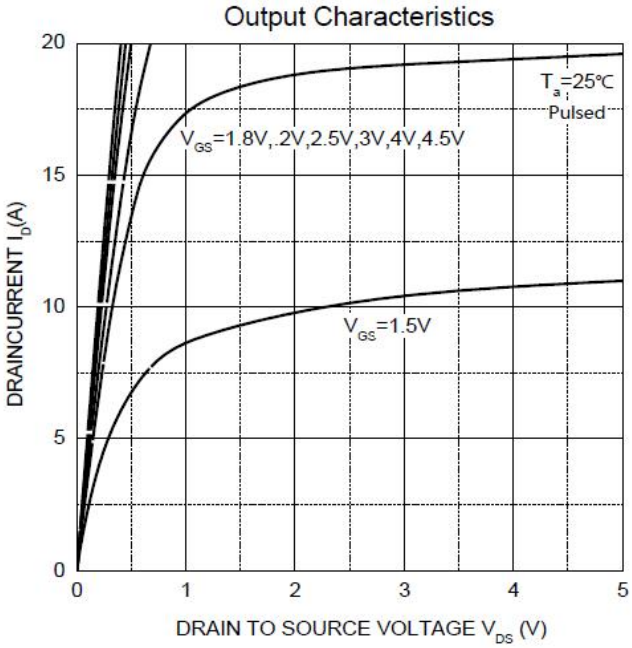


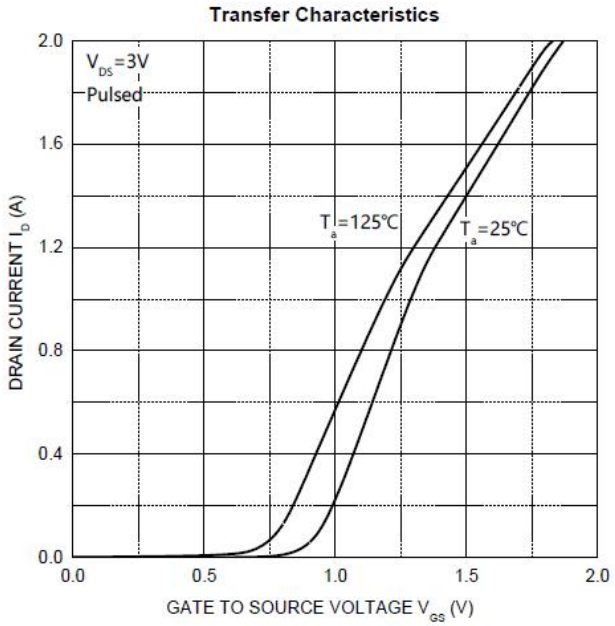


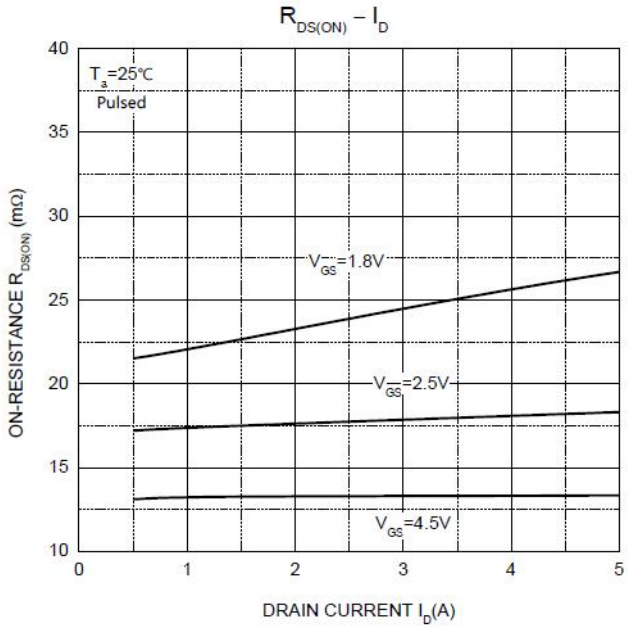


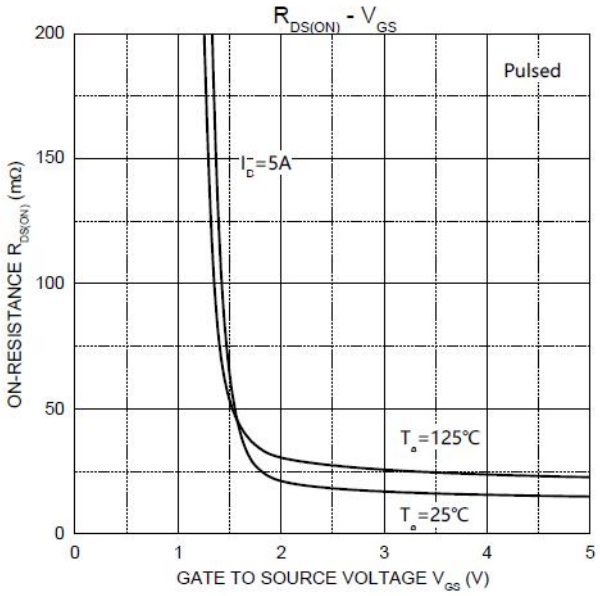


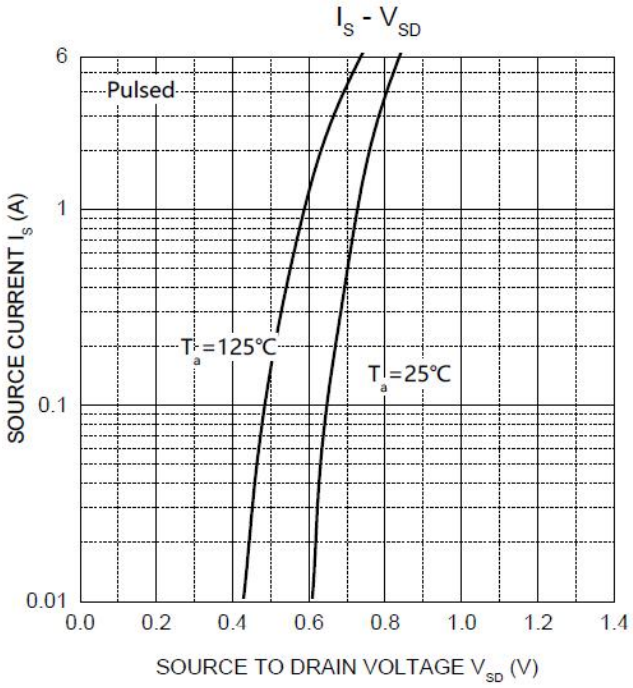
N-Channel MOS

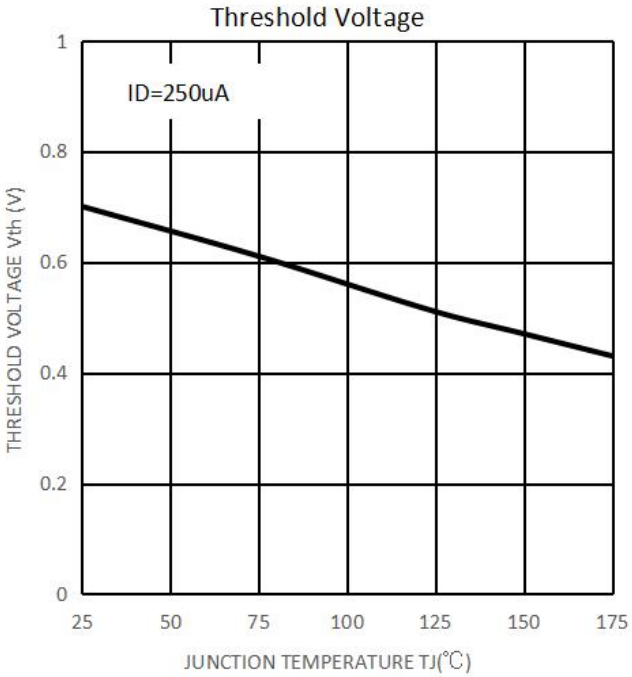




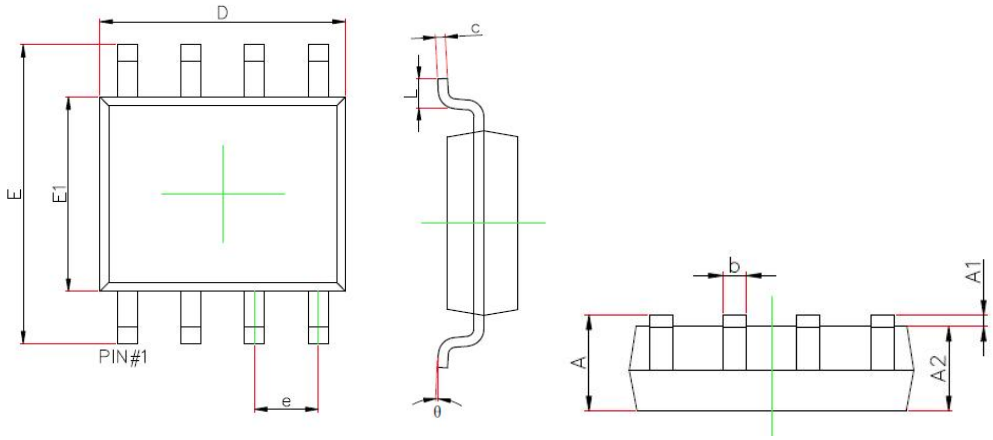






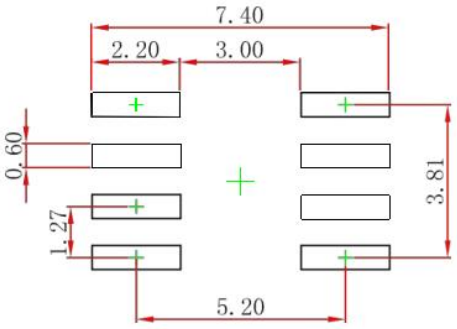


SOP8 Package Outline Dimensions



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	0.156	0.250	0.006	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	3.700	4.100	0.146	0.161
L	0.400	1.270	0.016	0.05
θ	0°	8°	0°	8°

SOP8 Suggested Pad Layout



Note:
1. Controlling dimension：in millimeters.
2. General tolerance:0.5mm.
3. The pad layout is for reference purposes only.

NOTICE

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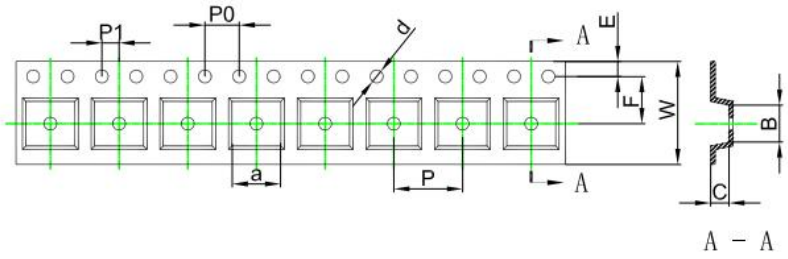
SOP8 Tape and Reel

SOP8 Embossed Carrier Tape



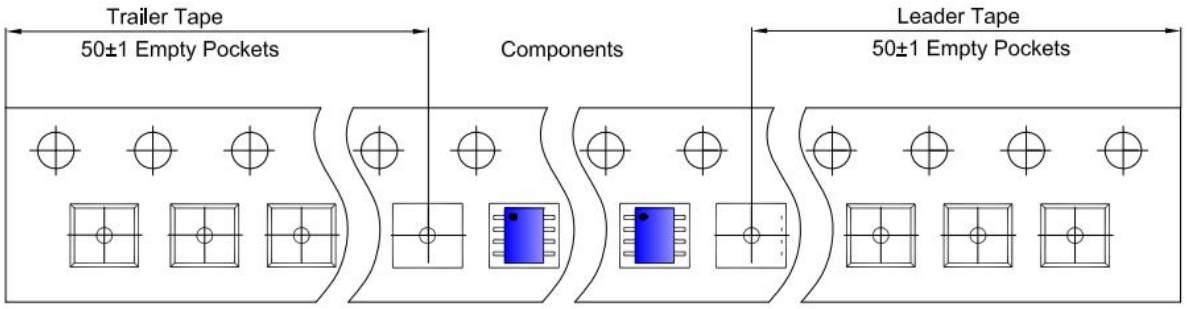
Packaging Description:

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).

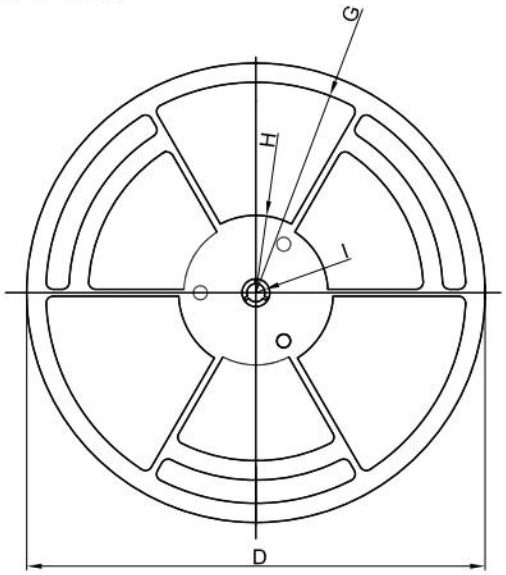
ALL DIM IN mm

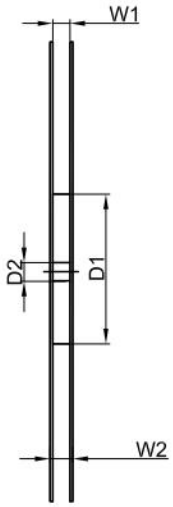
Dimensions are in millimeter										
Pkg type	a	B	C	d	E	F	P0	P	P1	W
SOP8	6.40	5.40	2.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

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	

Date of change	Rev #	revise content
2023/09/01	A/0	/