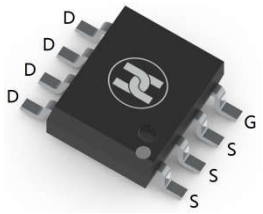
MOSFET (P-CHANNEL)

FEATURES

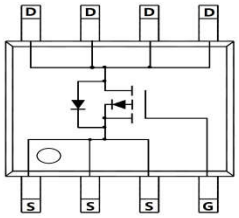
- V_{DS}=-30V
- I_D=-9.7A (V_{GS}=-10V)
- $R_{DS(ON)}$<20mΩ (V_{GS}=-10V)
  $R_{DS(ON)}$<35mΩ (V_{GS}=-4.5V)



SOP-8

MECHANICAL DATA

- Case: SOP-8
- Case material: Molded plastic. UL flammability
- Classification rating: 94V-0
- Weight: 0.3 grams (approximate)



MAXIMUM RATINGS (T_A=25°C unless otherwise specified)

Parameter		Symbol	Typ	Max	Unit
Drain-Source Voltage		V_{DS}		-30	V
Drain-Source Voltage		V_{GS}		±20	
Continuous Drain current	T_A=25°C	I_D		-9.7	A
	T_A=70°C			-7.8	
Pulsed Drain Current (note 3)		I_{DM}		-70	
Avalanche Current (note 3)		I_{AS}, I_{AR}		-27	
Avalanche energy L=0.1mH (note 3)		E_{AS}, E_{AR}		36	mJ
Power Dissipation (note 2)	T_A=25°C	P_D		3.1	W
	T_A=70°C			2	
Junction and Storage Temperature Range		T_J,T_{STG}		-55~150	°C
Thermal resistance from junction to ambient (note 1,t≤10s)		$R_{\theta JA}$	31	40	°C/W
Thermal resistance from junction to ambient (note 1&4,steady state)			59	75	
Thermal resistance from junction to lead (steady state)		$R_{\theta JL}$	16	24	

MOSFET (P-CHANNEL)

ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Drain-source breakdown voltage	V_{DSS}	-30			V	I_D=-250μA,V_{GS}=0V
Zero gate voltage drain current	I_{DSS}			-1	μA	V_{DS}=-30V,V_{GS}=0V
				-5		V_{DS}=-30V,V_{GS}=0V,T_J=55°C
Gate-body leakage current	I_{GSS}			±100	nA	V_{DS}=0V,V_{GS}=±20V
Gate threshold voltage	$V_{GS(th)}$	-1.5	-2.0	-2.5	V	V_{DS}=V_{GS},I_D=-250mA
On state drain current	$I_{D(ON)}$	-70			A	V_{GS}=-10V,V_{DS}=-5V
Static drain-source on resistance	$R_{DS(ON)}$		16.5	20	mΩ	V_{GS}=-10V,I_D=-9.7A
			24	29		V_{GS}=-10V,I_D=-9.7A,T_J=125°C
			26	35		V_{GS}=-4.5V,I_D=-7A
Forward trans-conductance	g_{FS}		27		S	V_{DS}=-5V,I_D=-9.7A
Diode forward voltage	V_{SD}		-0.75	-1	V	I_S=-1A,V_{GS}=0V
Body-diode continuous current	I_S			-4	A	
Pulsed body-diode current (note 3)	I_{SM}			-70		
Input capacitance	Ciss		1040		pF	V_{GS}=0V,V_{DS}=-15V,f=1MHz
Output capacitance	Coss		180			
Reverse transfer capacitance	Crss		125			
Gate resistance	Rg	2	4	6	Ω	V_{GS}=0V, V_{DS}=0V,f=1MHz
Total gate charge	Qg(10V)		19		nC	V_{GS}=-10V,V_{DS}=-15V,I_D=-9.7A
Total gate charge	Qg(4.5V)		9.6			
Gate source charge	Qgs		3.6			
Gate drain charge	Qgd		4.6			
Turn-on delay time	$t_{D(on)}$		10		ns	V_{GS}=-10V,V_{DS}=-15V, R_L=1.5W,R_{GEN}=3W
Turn-on rise time	tr		5.5			
Turn-off delay time	$t_{D(off)}$		26			
Turn-off fall time	tf		9			
Body diode reverse recovery time	trr		11.5			I_F=-9.7A, dI/dt=500A/ms
Body diode reverse recovery charge	Qrr		25		nC	

Note:

1. The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.
2. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using ≤10s junction-to-ambient thermal resistance.
3. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J=25°C.
4. The $R_{\theta JA}$ is the sum of the thermal resistance from junction to lead $R_{\theta JI}$ and lead to ambient.
5. The static characteristics in Figures 1 to 6 are obtained using <300ms pulses, duty cycle 0.5% max.
6. These curves are based on the junction-to-ambient thermal resistance which is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, assuming a maximum junction temperature of $T_{J(MAX)}$=150°C. The SOA curve provides a single pulse rating.

MOSFET (P-CHANNEL)

TYPICAL CHARACTERISTICS

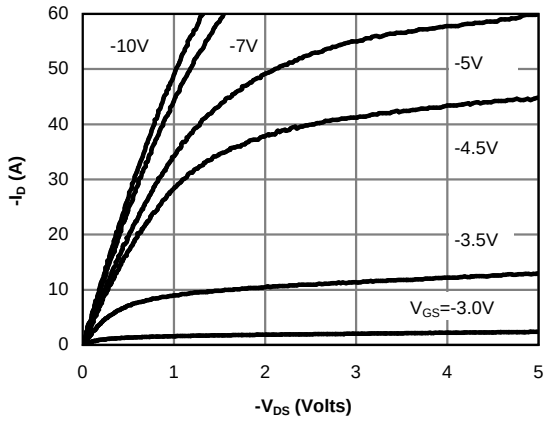


Fig 1: On-Region Characteristics (Note E)

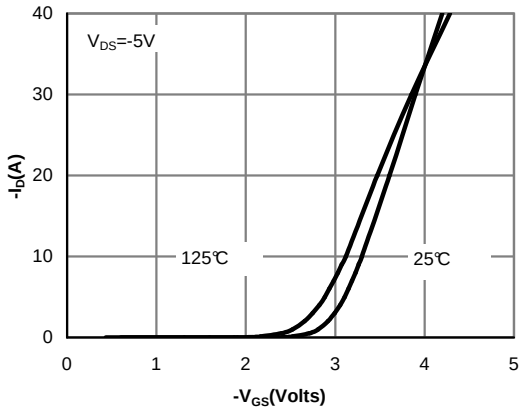


Figure 2: Transfer Characteristics (Note E)

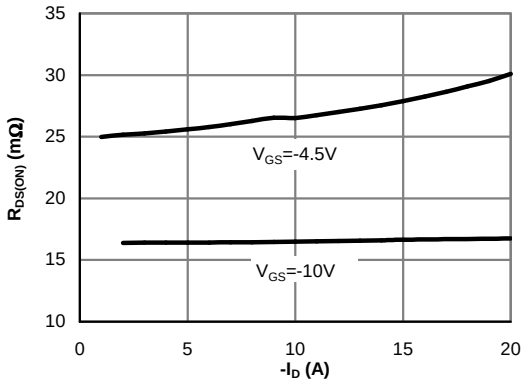


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

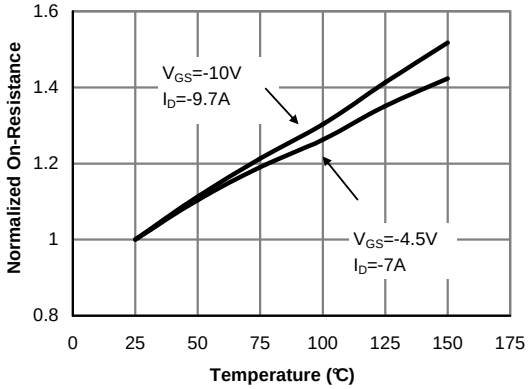


Figure 4: On-Resistance vs. Junction Temperature (Note E)

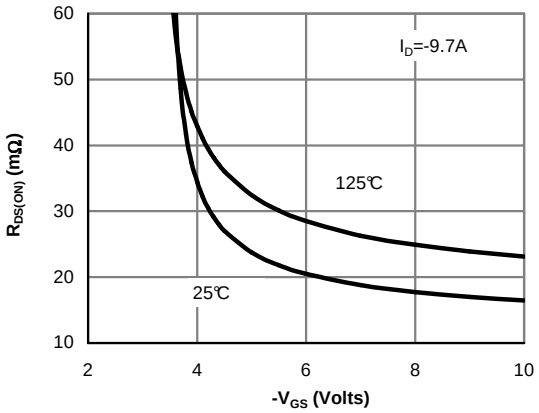


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

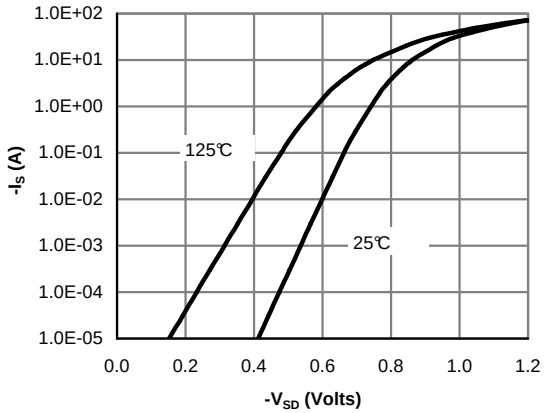


Figure 6: Body-Diode Characteristics (Note E)

MOSFET (P-CHANNEL)

TYPICAL CHARACTERISTICS (continued)

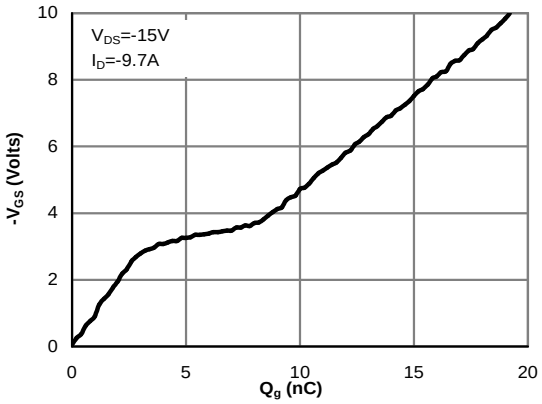


Figure 7: Gate-Charge Characteristics

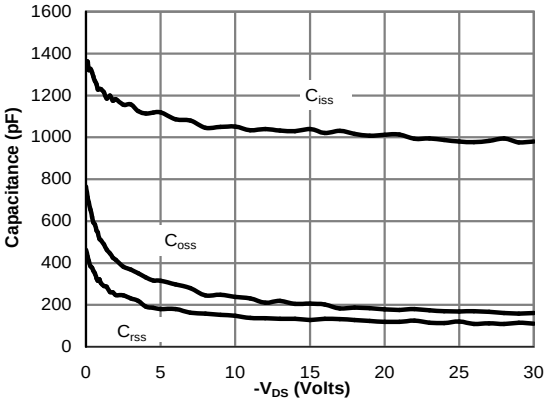


Figure 8: Capacitance Characteristics

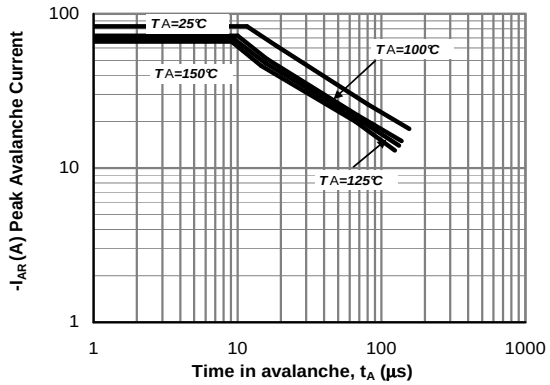


Figure 9: Single Pulse Avalanche capability (Note C)

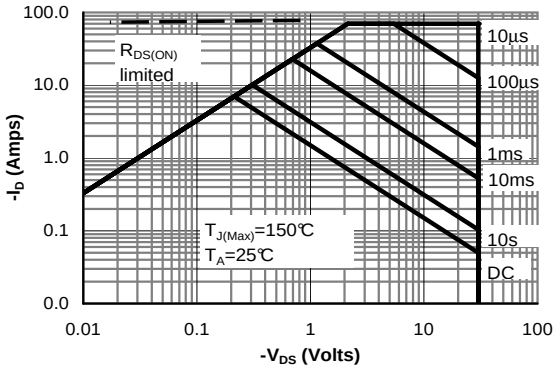


Figure 10: Maximum Forward Biased Safe Operating Area (Note F)

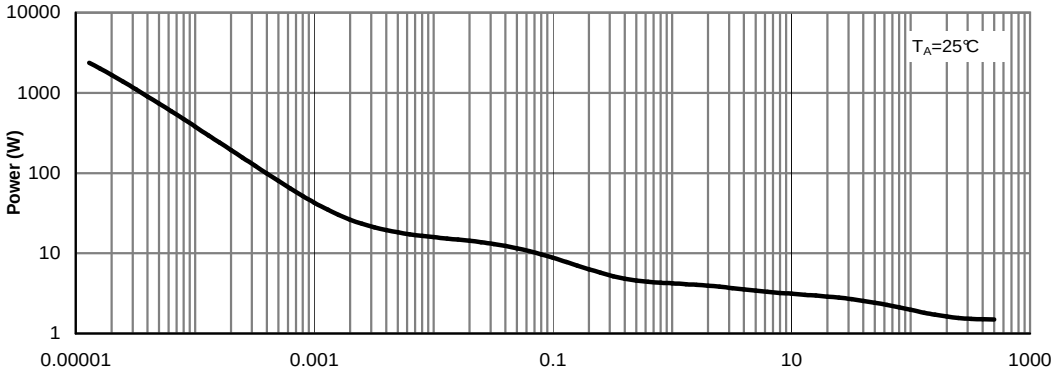


Figure 11: Single Pulse Power Rating Junction-to-Ambient (Note F)

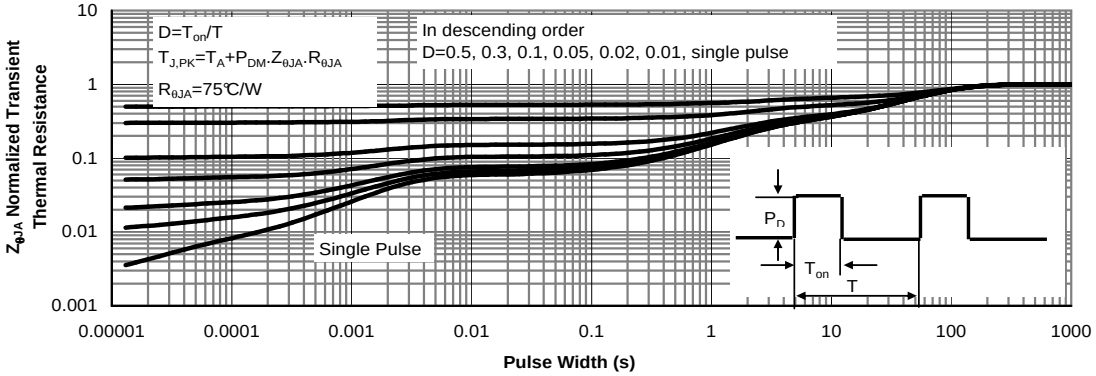
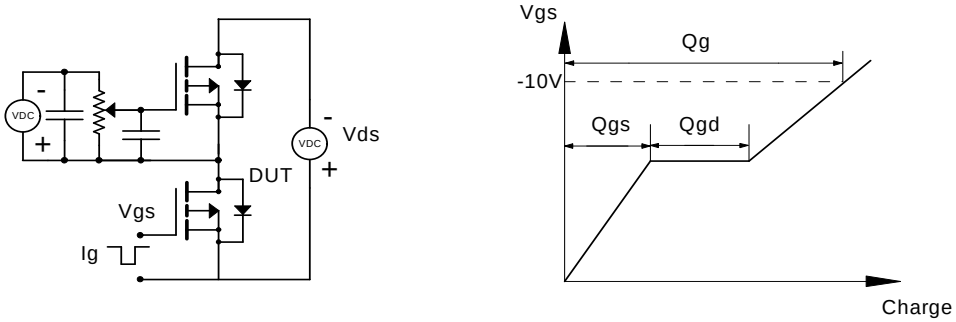


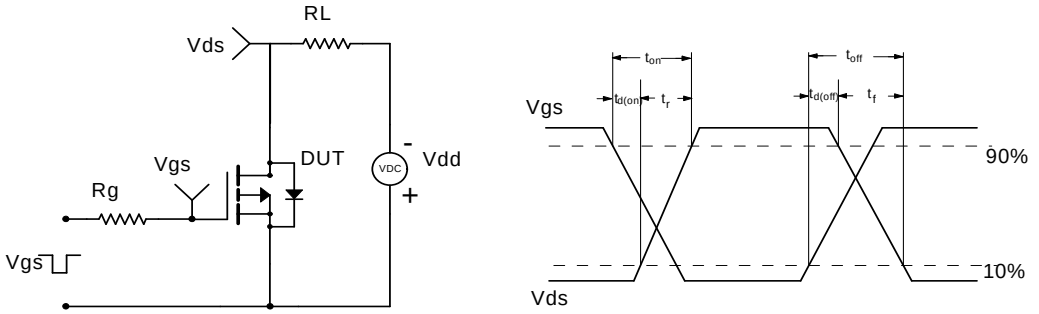
Figure 12: Normalized Maximum Transient Thermal Impedance (Note F)

MOSFET (P-CHANNEL)

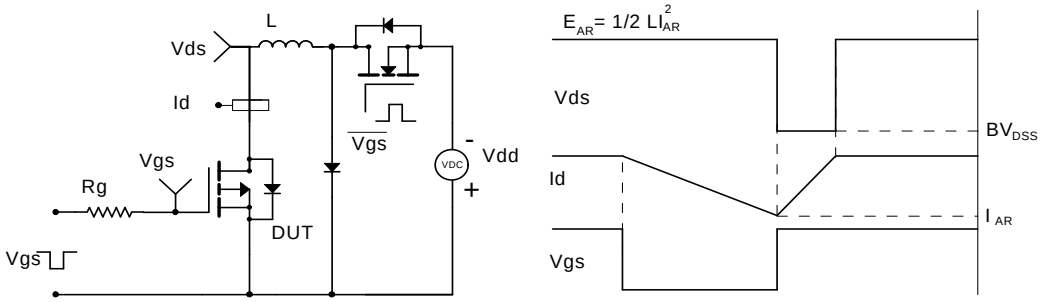
TEST CIRCUIT &WAVEFORM



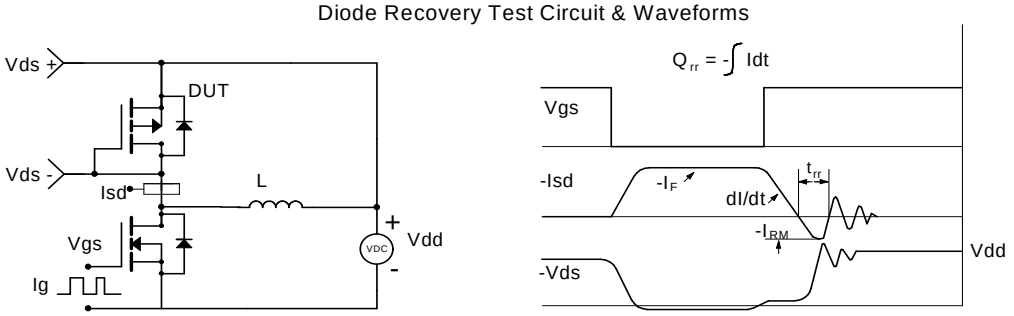
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

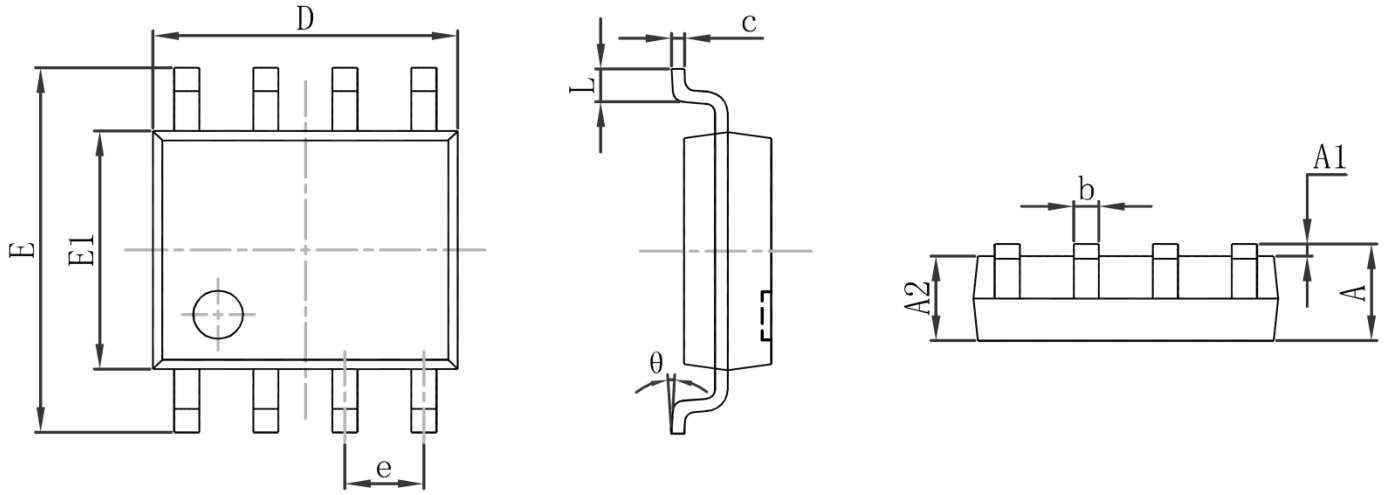


Diode Recovery Test Circuit & Waveforms



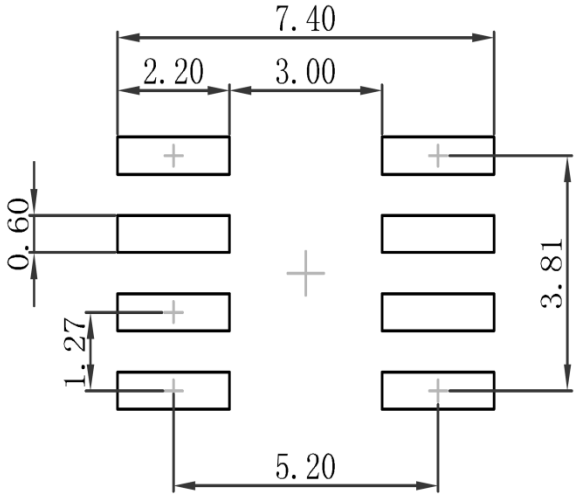
MOSFET (P-CHANNEL)

SOP-8 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	0.170	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
θ	0°	8°	0°	8°

SOP-8 Suggested Pad Layout



Note:

1.Controlling dimension: in millimeters

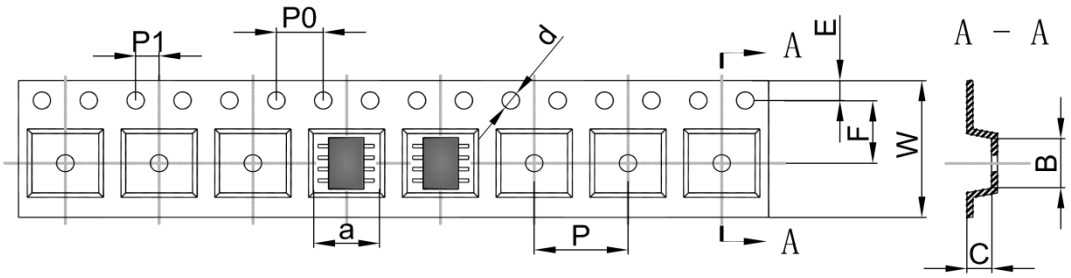
2.General tolerance: ±0.05mm

3.The pad layout is for reference purposes only

MOSFET (P-CHANNEL)

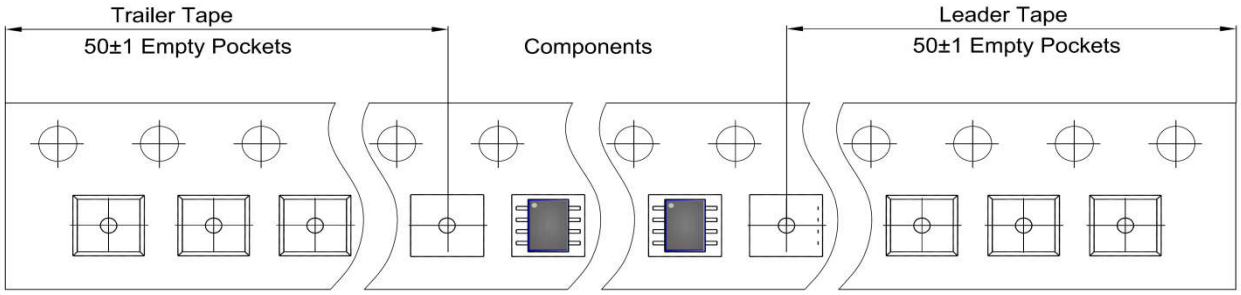
SOP-8 Tape and Reel

SOP-8 Embossed Carrier Tape

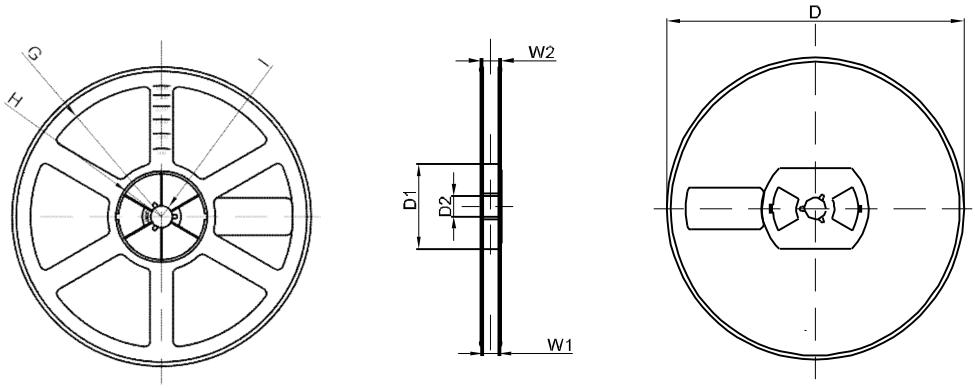


	DIMENSIONS ARE IN MILLIMETER									
TYPE	A	B	C	d	E	F	P0	P	P1	W
SOP-8	6.40	5.40	2.10	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

SOP-8 Tape Leader and Trailer



SOP-8 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
TOLERANCE	±2	±1	±1	±1	±1	±1	±1	±1