

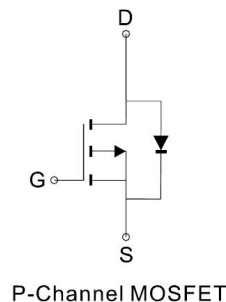
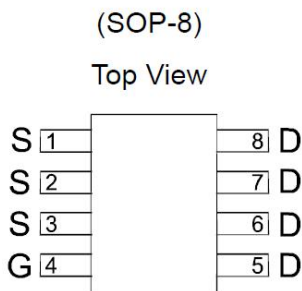
## FEATURES

- ✧  $R_{DS(on)} = 13m\Omega @ V_{GS} = -10V, I_D = -12A$
- ✧  $R_{DS(on)} = 20m\Omega @ V_{GS} = -4.5V, I_D = -12A$
- ✧ High performance trench technology for extremely low  $R_{DS(on)}$
- ✧ High power and current handing capability
- ✧ ROHS Compliant

## APPLICATIONS

- ✧ Power Management in Note book
- ✧ Portable Equipment
- ✧ Battery Powered System
- ✧ DC/DC Converter
- ✧ Load Switch
- ✧ DSC
- ✧ LCD Display inverter

## PIN CONFIGURATION



## Absolute Maximum Ratings (TA = 25 unless otherwise noted)

Symbol	Parameter	Ratings	Units
$V_{DS}$	Drain to Source Voltage	-30	V
$V_{GS}$	Gate to Source Voltage	±20	V
$I_D$	Drain Current -Continuous (Note1a)	-12	A
	-Pulsed	-75	A
$P_D$	Power Dissipation for Single Operation (Note1a)	2.5	W
	(Note1b)	1.2	
	(Note1c)	1.0	
$T_J, T_{STG}$	Operating and Storage Temperature	-55 to 150	°C

## Thermal Characteristics

$R_{\theta JA}$	Thermal Resistance , Junction to Ambient (Note 1a)	50	°C/W
$R_{\theta JC}$	Thermal Resistance , Junction to Case (Note 1)	25	°C/W

## Ordering Information

Device	Package	Units per Reel
JY9425X	SOP-8	3000PCS

**Electrical Characteristics**  $T_J = 25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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**Off Characteristics**

$B_{VDSS}$	Drain to Source Breakdown Voltage	$I_D = -250\mu\text{A}, V_{GS} = 0\text{V}$	-30			V
$\frac{\Delta B_{VDSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	$I_D = -250\mu\text{A}$ , referenced to $25^\circ\text{C}$		-20		mV/ $^\circ\text{C}$
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = -24\text{V}, V_{GS} = 0\text{V}$			-1	$\mu\text{A}$
$I_{GSS}$	Gate to Source Leakage Current	$V_{GS} = \pm 25\text{V}, V_{DS} = 0\text{V}$			$\pm 100$	nA

**On Characteristics (Note 2)**

$V_{GS(th)}$	Gate to Source Threshold Voltage	$V_{GS} = V_{DS}, I_D = -250\mu\text{A}$	-1	-1.9	-3	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate to Source Threshold Voltage Temperature Coefficient	$I_D = -250\mu\text{A}$ , referenced to $25^\circ\text{C}$		8.1		mV/ $^\circ\text{C}$
$r_{DS(on)}$	Drain to Source On Resistance	$V_{GS} = -10\text{V}, I_D = -12\text{A}$		13	15	mΩ
		$V_{GS} = -4.5\text{V}, I_D = -12\text{A}$		20	22	
		$V_{GS} = -10\text{V}, I_D = -12\text{A}$ $T_J = 125^\circ\text{C}$		17	22	
$g_{FS}$	Forward Transconductance	$V_{DS} = -5\text{V}, I_D = -12\text{A}$		60		S

**Dynamic Characteristics**

$C_{iss}$	Input Capacitance	$V_{DS} = -15\text{V}, V_{GS} = 0\text{V},$ $f = 1.0\text{MHz}$		1200		pF
$C_{oss}$	Output Capacitance			400		pF
$C_{rss}$	Reverse Transfer Capacitance			160	190	pF

**Switching Characteristics (Note 2)**

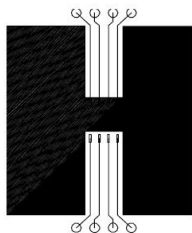
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = -15\text{V}, I_D = -1\text{A}$ $V_{GS} = -10\text{V}, R_{GS} = 6\Omega$		7		ns
$t_r$	Rise Time			9	12	ns
$t_{d(off)}$	Turn-Off Delay Time			25.6	28	ns
$t_f$	Fall Time			12	16	ns
$Q_g$	Total Gate Charge	$V_{DS} = -15\text{V}, V_{GS} = -10\text{V},$ $I_D = -12\text{A}$		88	124	nC
$Q_g$	Total Gate Charge	$V_{DS} = -15\text{V}, V_{GS} = -5\text{V},$ $I_D = -12\text{A}$		46	65	nC
$Q_{gs}$	Gate to Source Gate Charge			8		nC
$Q_{gd}$	Gate to Drain Charge			23.5		nC

**Drain-Source Diode Characteristics**

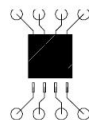
$V_{SD}$	Source to Drain Diode Forward Voltage	$V_{GS} = 0\text{V}, I_S = -2.1\text{A}$		-0.7	-1.2	V
$t_{rr}$	Reverse Recovery Time	$I_F = 12\text{A}, di/dt = 100\text{A}/\mu\text{s}$			45	ns
$Q_{rr}$	Reverse Recovery Charge	$I_F = 12\text{A}, di/dt = 100\text{A}/\mu\text{s}$			34	nC

**Notes:**

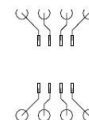
1:  $R_{\theta JA}$  is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins.  $R_{\theta JC}$  is guaranteed by design while  $R_{\theta CA}$  is determined by the user's board design.



a)  $50^\circ\text{C}/\text{W}$  (10 sec)  
when mounted on a  $1\text{ in}^2$   
pad of 2 oz copper



b)  $105^\circ\text{C}/\text{W}$  when mounted  
on a  $.04\text{ in}^2$  pad of 2 oz  
copper

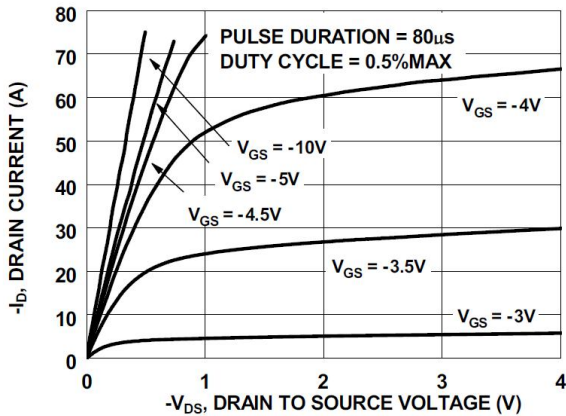
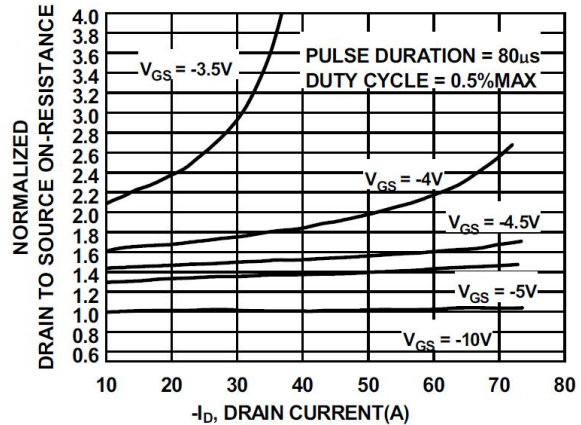
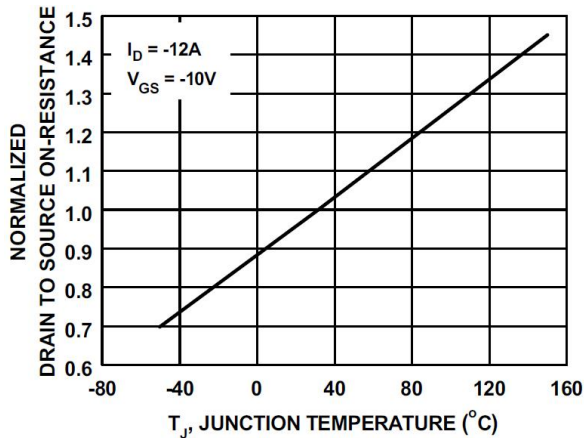
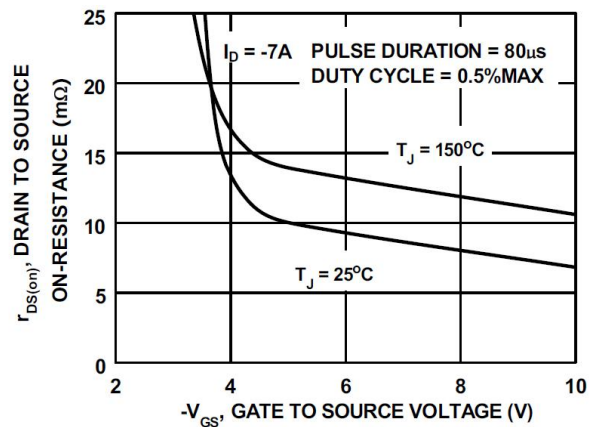
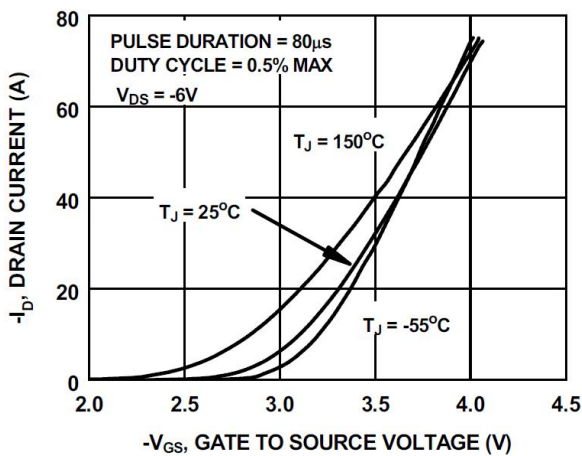
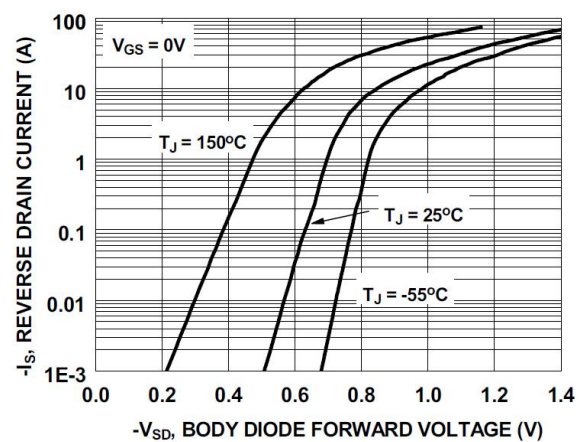


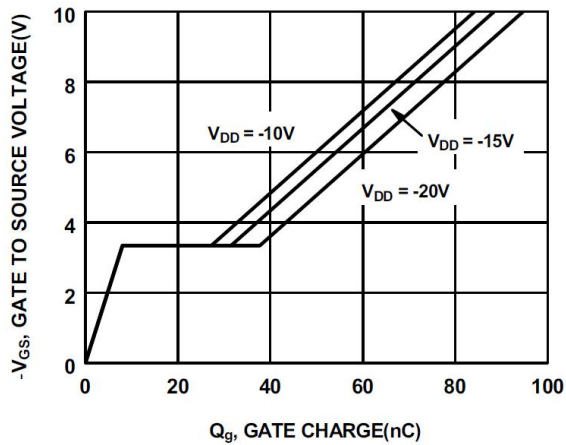
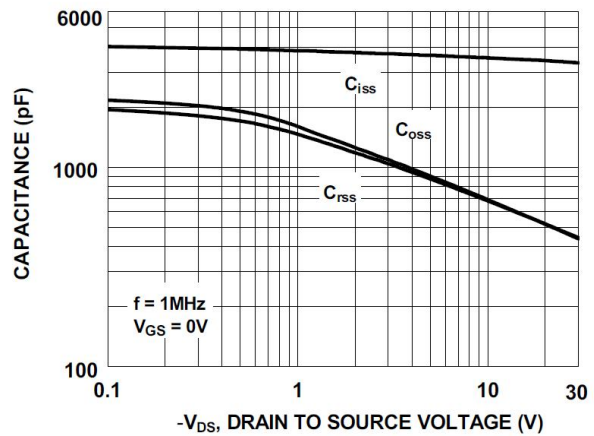
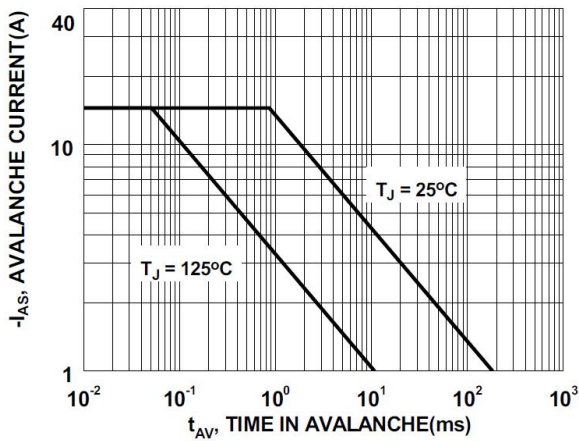
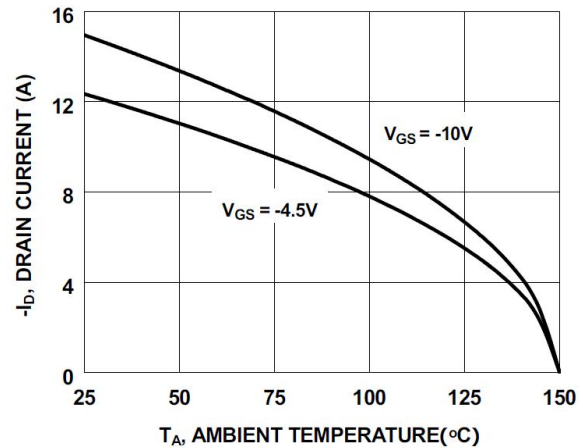
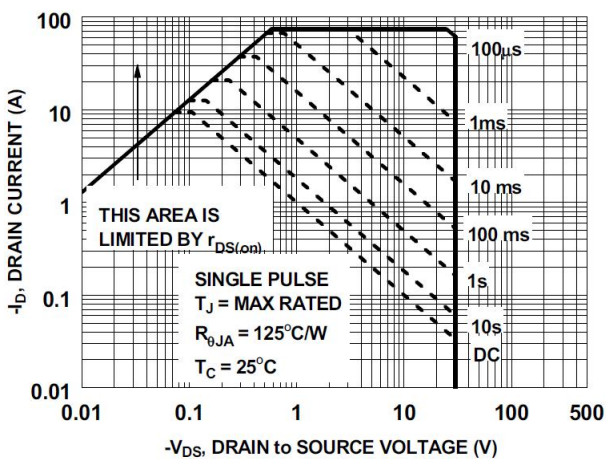
c)  $125^\circ\text{C}/\text{W}$  when mounted  
on a minimum pad

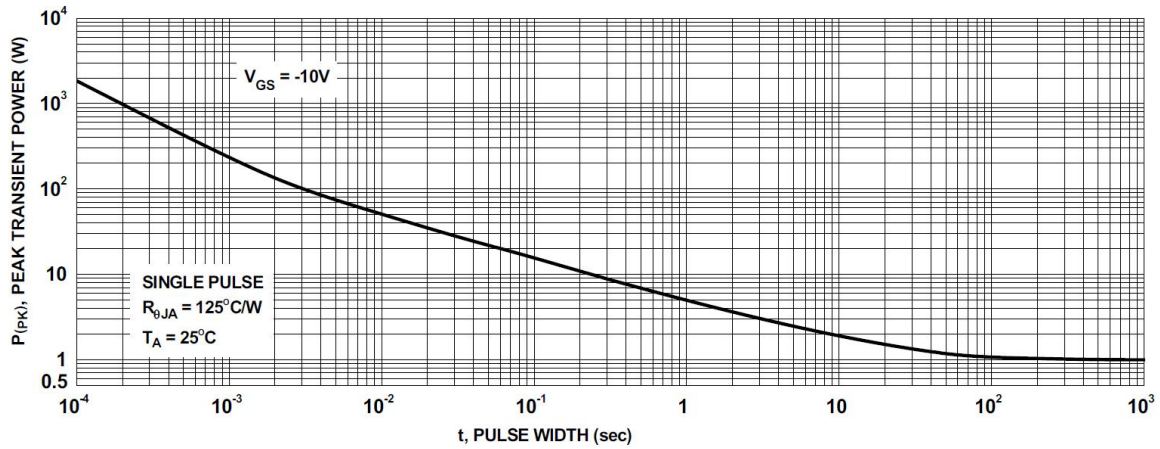
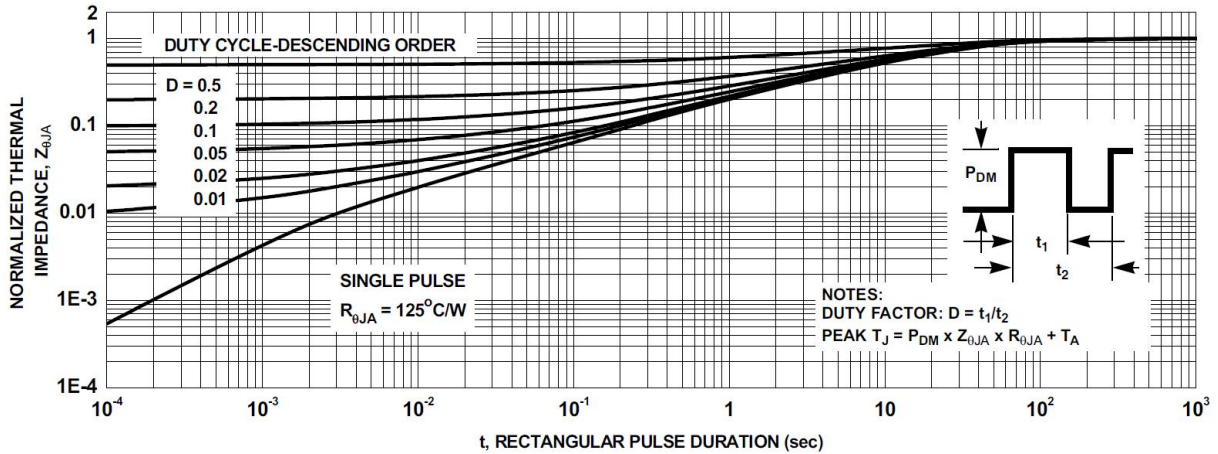
Scale 1 : 1 on letter size paper

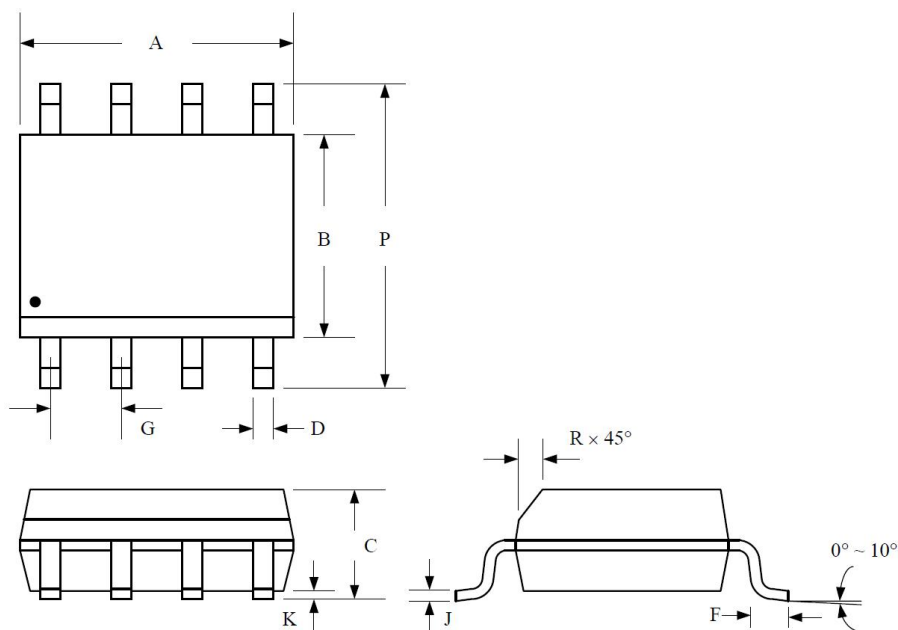
2: Pulse Test: Pulse Width <  $300\mu\text{s}$ , Duty Cycle < 2.0%.

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**Typical Characteristics**  $T_J = 25^\circ\text{C}$  unless otherwise noted

**Figure 1. On Region Characteristics**

**Figure 2. Normalized On-Resistance vs Drain Current and Gate Voltage**

**Figure 3. Normalized On Resistance vs Junction Temperature**

**Figure 4. On-Resistance vs Gate to Source Voltage**

**Figure 5. Transfer Characteristics**

**Figure 6. Source to Drain Diode Forward Voltage vs Source Current**

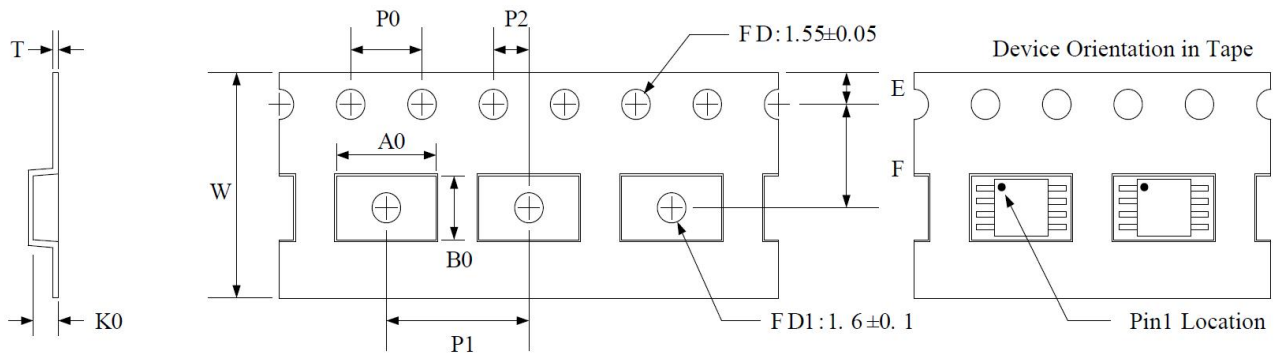
**Typical Characteristics**  $T_J = 25^\circ\text{C}$  unless otherwise noted

**Figure 7. Gate Charge Characteristics**

**Figure 8. Capacitance vs Drain to Source Voltage**

**Figure 9. Unclamped Inductive Switching Capability**

**Figure 10. Maximum Continuous Drain Current vs Ambient Temperature**

**Figure 11. Forward Bias Safe Operating Area**

**Typical Characteristics**  $T_J = 25^\circ\text{C}$  unless otherwise noted

**Figure 13. Single Pulse Maximum Power Dissipation**

**Figure 14. Junction-to-Ambient Transient Thermal Response Curve**

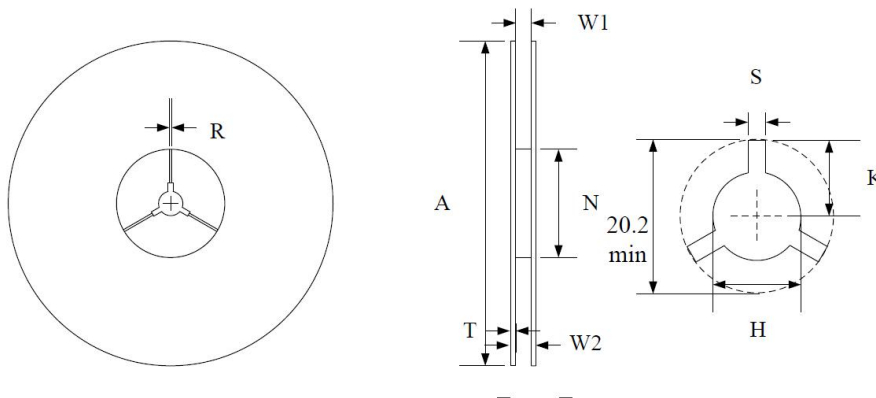
**SOP-8 package**

**Package Dimensions (Controlling dimensions are in millimeters)**

Symbol	Dimensions (mm)		Dimensions (Inches)	
	Minimum	Maximum	Minimum	Maximum
A	4.800	5.000	0.189	0.196
B	3.800	4.000	0.150	0.157
C	1.350	1.750	0.054	0.068
D	0.350	0.490	0.014	0.019
F	0.400	1.250	0.016	0.049
G	1.27 BSC		0.05 BSC	
J	0.180	0.250	0.007	0.009
K	0.100	0.250	0.004	0.008
P	5.800	6.200	0.229	0.244
R	0.250	0.500	0.010	0.019

## Tape and Reel Specification

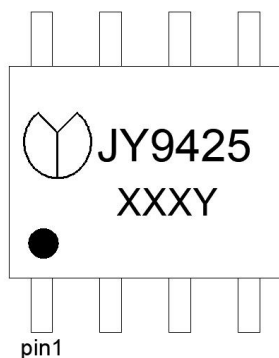


Symbol	W	A0	B0	K0	E	F	P1	P0	P2	T
Dimensions (mm)	12.00±0.3	6.40±0.1	5.2±0.1	2.10±0.1	1.75±0.1	5.50±0.1	8.00±0.1	4.0±0.1	2.0±0.1	0.3±0.05

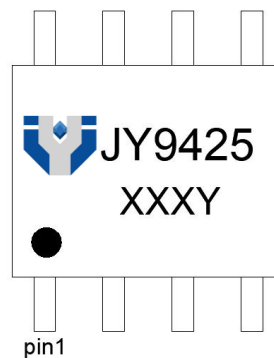


Symbol	Reel Size	A	N	W2	W1	H	T	S	K	R
Dimensions (mm)	Φ330	330.0±2.0	100.0±2.0	18.4 max	12.4+2.0 -0.0	13.0+0.5 -0.2	2.0±0.2	1.5 min	10.1 min	2.5 min

## Marking Information



OR



(1) JY9425X: Part number, fixed  
(2) XXX: Wafer's Lot No Y:  
Internal code

(1) JY9425X: Part number,  
fixed (2) XXX: Wafer's Lot No  
Y: Internal code



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