

P-Channel MOSFET

Features

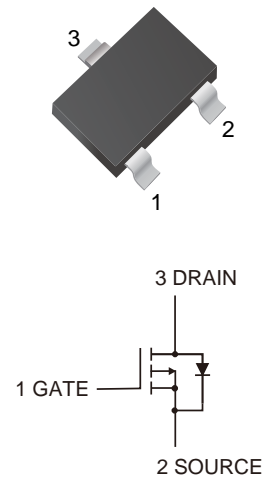
- $V_{DS} = -20V$, $I_D = -4.1A$
- $R_{DS(ON)} < 46m\Omega$ ($V_{GS} = -4.5V$)
- $R_{DS(ON)} < 70m\Omega$ ($V_{GS} = -2.5V$)
- High Power and Current Handling Capability
- Lead Free Product is Acquired
- Surface Mount Package
- Lead free in comply with EU RoHS 2011/65/EU directives
- Moisture Sensitivity Level 3

Mechanical Data

- Case: SOT-23
- Approx. Weight: 8.1mg

Ordering Information

Part Number	Marking	Shipping	Reel
LTM2305PA-TR3	P5A	3000PCS Tape&Reel	7 inches
LTM2305PA-TR12	P5A	12000PCS Tape&Reel	13 inches



Maximum Ratings ($T_a = 25^\circ C$)

Symbol	Parameter	Value	Units
V_{DSS}	Drain-source Voltage	- 20	V
V_{GS}	Gate - source - Voltage	± 12	V
I_D	Continuous Drain Current	$T_C = 25^\circ C$	- 4.1
		$T_C = 100^\circ C$	- 3.2
I_{DM}	Pulsed Drain Current (note 1)	- 15	A
P_D	Power Dissipation	1.7	W
T_J, T_{STG}	Operating And Storage Temperature Range	- 55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	74	$^\circ C/W$

Electrical Characteristics ($T_a = 25^\circ C$)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
$V_{(BR)DSS}$	Drain-source Breakdown Voltage	$V_{GS} = 0V, I_D = -250\mu A$	- 20			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -20V, V_{GS} = 0V$			- 1	μA
I_{GSS}	Gate-body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 12V$			± 100	nA
$V_{GS(th)}$	Gate-Threshold Voltage (note 2)	$V_{DS} = V_{GS}, I_D = -250\mu A$	- 0.45	- 0.7	- 1.0	V
$R_{DS(on)}$	Drain-source On-Resistance (note 2)	$V_{GS} = -4.5V, I_D = -4.1A$		35	46	$m\Omega$
		$V_{GS} = -2.5V, I_D = -3A$		46	70	
g_{FS}	Forward Transconductance	$V_{DS} = -5V, I_D = -2A$		6		S

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = -10V$		954		pF
C_{oss}	Output Capacitance	$V_{GS} = 0V$		131		
C_{rss}	Reverse Transfer Capacitance	$f = 1MHz$		103		
Q_g	Total Gate Charge	$V_{DS} = -10V$		7.8		nC
Q_{gs}	Gate - Source Charge	$I_D = -4.1A$		1.2		
Q_{gd}	Gate - Drain ("Miller") Charge	$V_{GS} = -4.5V$		1.6		

Switching Characteristics

$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = -10V, I_D = -3.3A,$ $R_G = 1\Omega, V_{GEN} = -4.5V,$ $R_L = 1.2\Omega$		12		ns
t_r	Turn-on Rise Time			35		
$t_{d(off)}$	Turn-off Delay Time			30		
t_f	Turn-off Fall Time			10		

Drain-Source Diode Characteristics and Maximum Ratings

I_S	Maximum Continuous Drain to Source Diode Forward Current			-4.1	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current			-15	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_S = -4.1A$		-1.2	V
t_{rr}	Reverse Recovery Time	$V_{GS} = 0V, I_S = -4.1A,$ $di/dt = 100A/\mu s$		20	ns
Q_{rr}	Reverse Recovery Charge			9	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

Typical Performance Characteristics

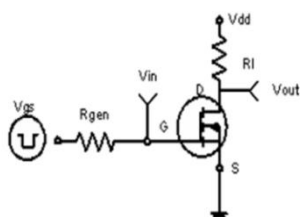


Figure1: Switching Test Circuit

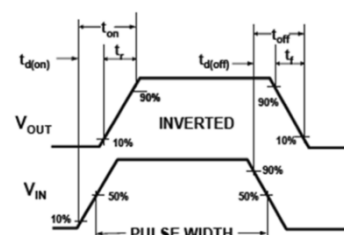


Figure2: Switching Waveforms



Characteristics Curves

Fig.1 VDS - ID CHARACTERISTICS

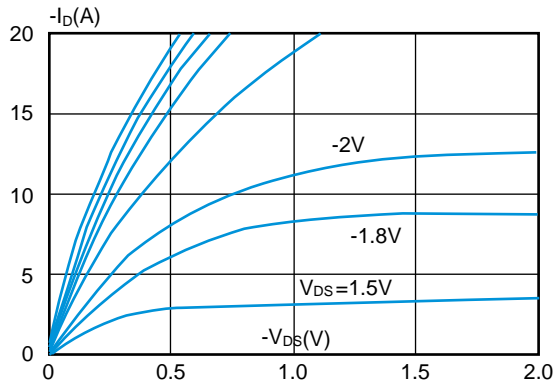


Fig.2 VGS - ID CHARACTERISTICS

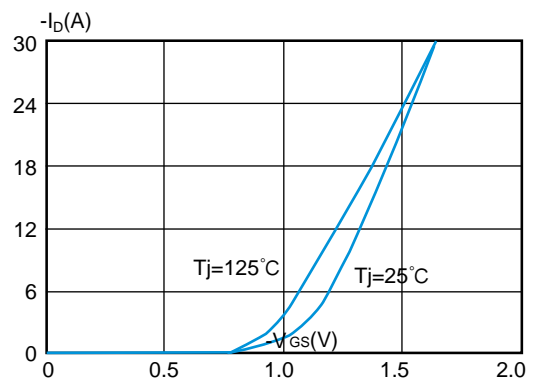


Fig.3 VDS - IS CHARACTERISTICS

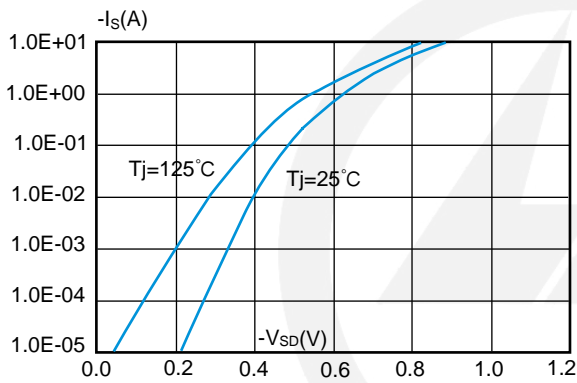


Fig.4 RDS(ON) - ID CHARACTERISTICS

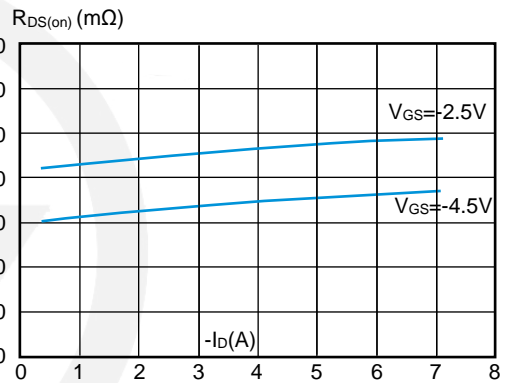


Fig.5 Gate Charge Characteristics

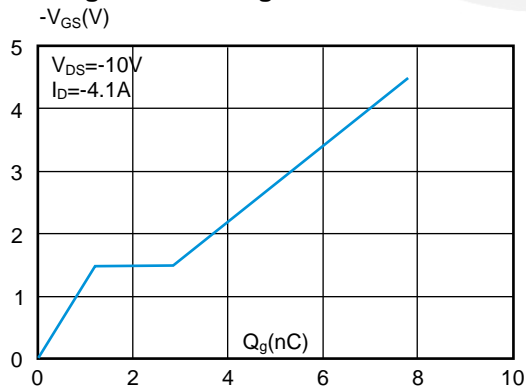
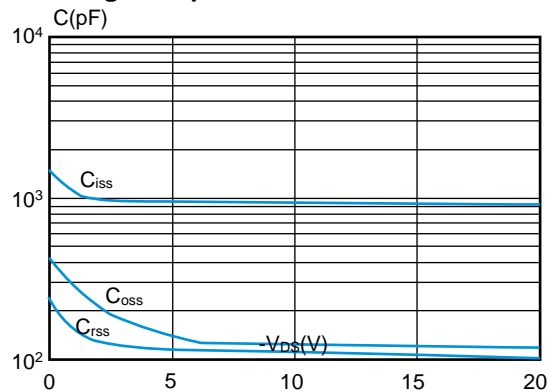
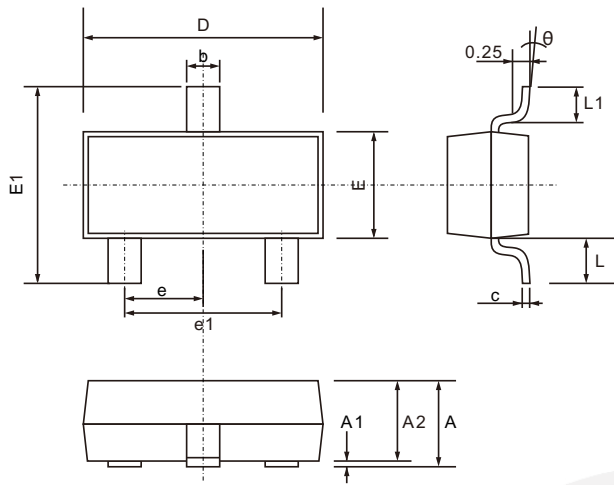


Fig.6 Capacitance Characteristics



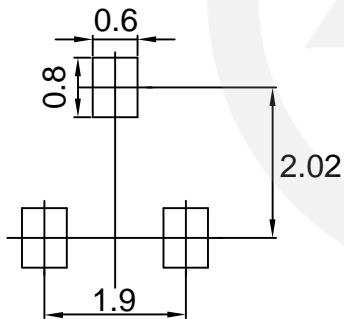
SOT-23 Package Outline

Unit: mm



SYMBOL	DIMENSIONS	
	MIN.	MAX.
A	0.900	1.200
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.200
D	2.700	3.100
E	1.200	1.400
E1	2.200	2.600
e	0.950 TYP.	
e1	1.750	2.050
L	0.550 TYP.	
L1	0.300	0.500
θ	0°	8°

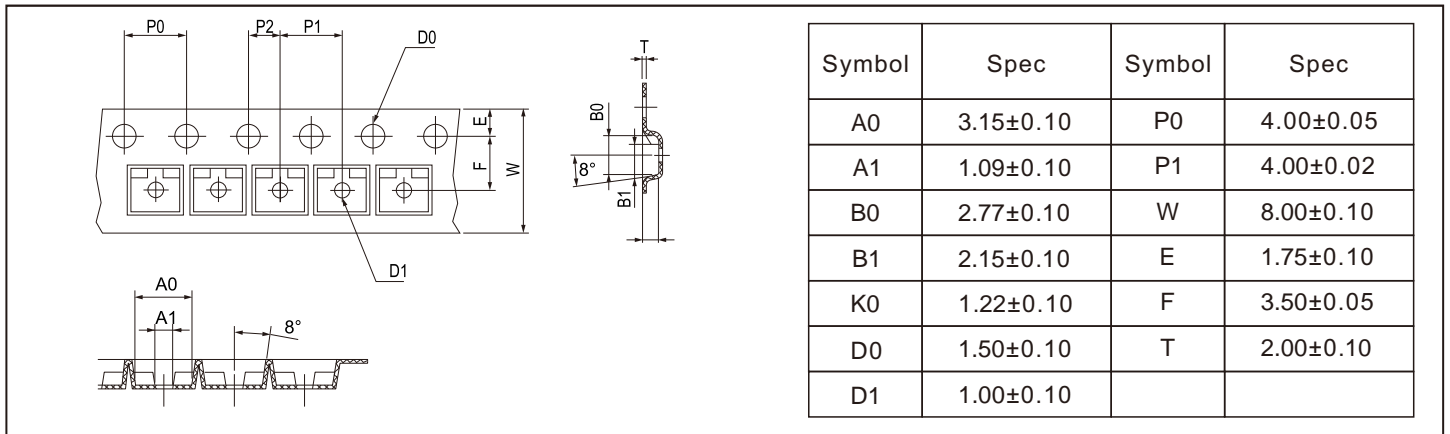
SOT-23 Suggested Pad Layout



Note:
 1. Controlling dimension: in millimeters.
 2. General tolerance: ± 0.05 mm
 3. The pad layout is for reference purpose only.

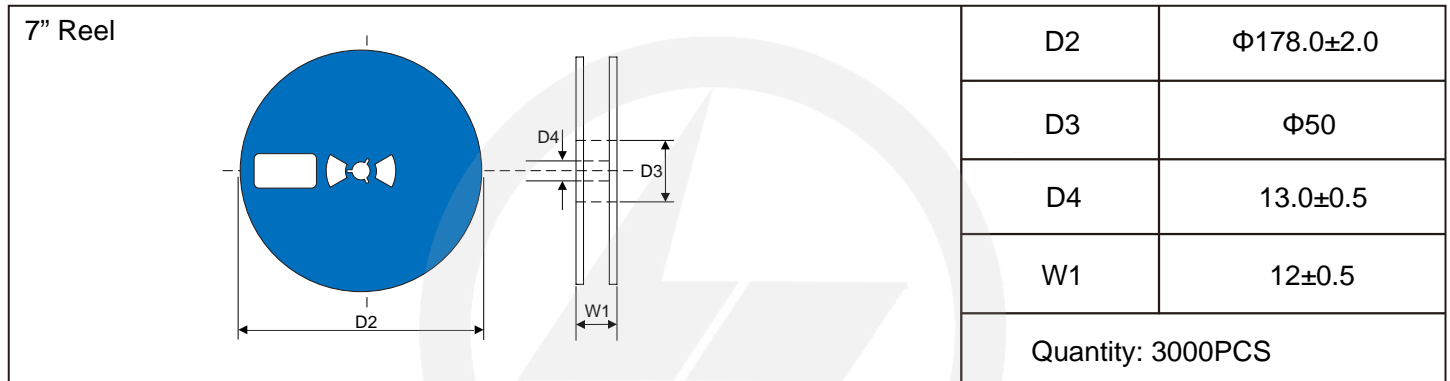
Carrier Tape Dimensions

Unit : mm



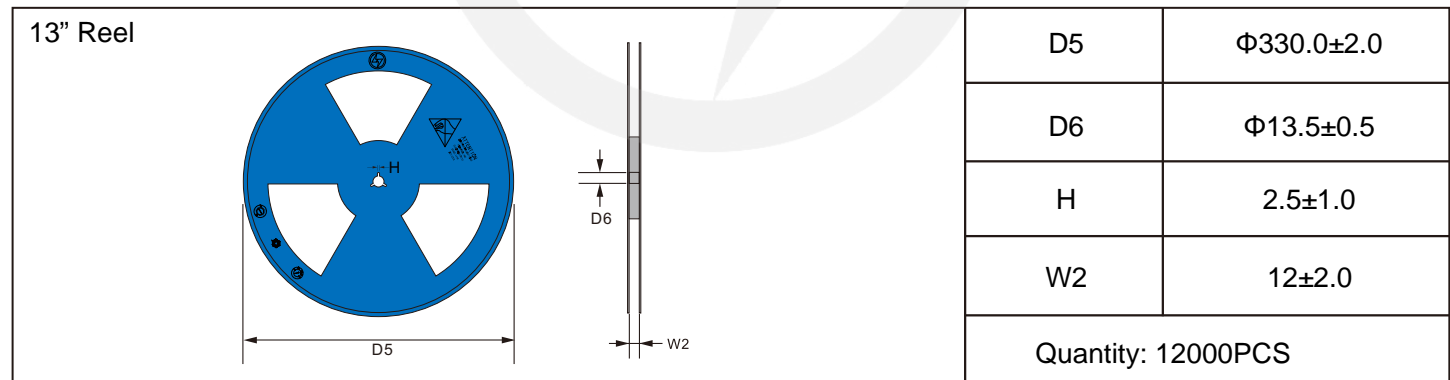
Reel Dimensions

Unit : mm

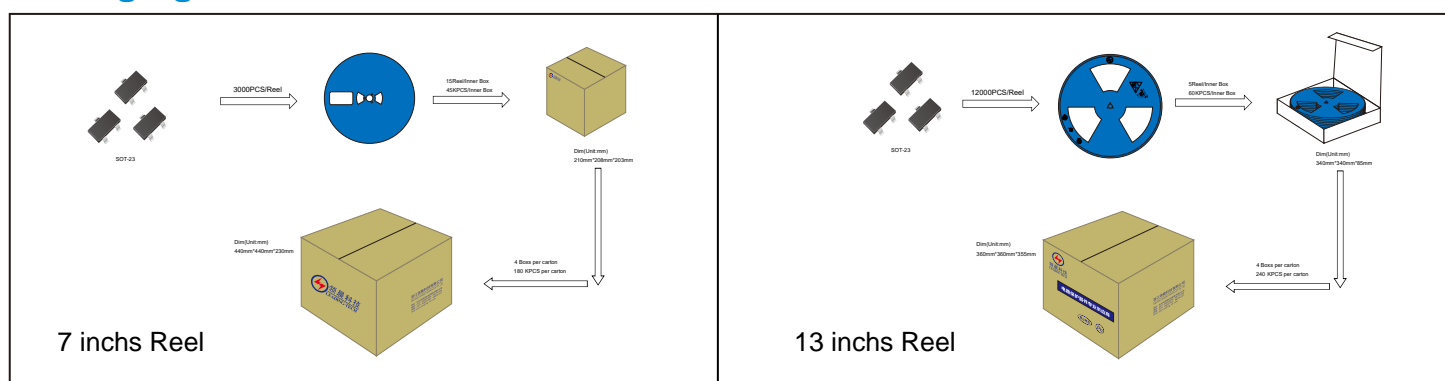


Reel Dimensions

Unit : mm



Packaging





Recommended Soldering Conditions



Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T _L to T _P)	3°C/second max.
Preheat	
-Temperature Min (T _{S min})	150°C
-Temperature Max (T _{S max})	200°C
-Time (min to max) (t _s)	60-180 seconds
T _{S max} to T _L	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
-Temperature (T _L)	217°C
-Time (t _L)	60-150 seconds
Peak Temperature (T _P)	260°C
Time within 5°C of actual Peak Temperature (t _p)	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

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Version Update information

Series NO.	Enactment/Revision Date	Effective Date	Version	Revision Content	Revision Reason	Revision Person	Note
01	2024.03.12	2024.03.12	3.0	New file	/	Ding	
02	2025.05.11	2025.05.11	3.1	Add Moisture Sensitivity Level 3	/	Ding	
03	2026.03.05	2026.03.05	3.2	Package outline E1(max)=2.6mm	/	Ding	