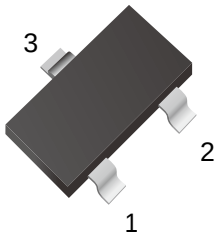
-50V/0.13A P-Channel Advanced Power Mosfet

Features

- Low $R_{DS(on)}$ @V_{GS}=-10V
- 3.3V Logic Level Control
- Lead free in comply with EU RoHS 2011/65/EU directives

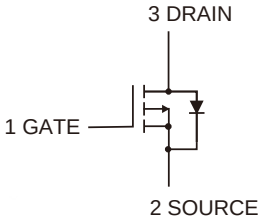


Mechanical Data

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

Application

- LED Lighting Application
- ON/OFF switch
- Networking



Ordering Information

Part Number	Marking	Shipping	Reel
LTM84P-TR3	PD	3000PCS Tape&Reel	7 inchs
LTM84P-TR12	PD	12000PCS Tape&Reel	13 inchs

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ Typ	I_D Max
-50V	8Ω @ -10V	-0.13A
	10Ω @ -5V	

Maximum Ratings and Thermal Characteristics (Ta=25°C unless otherwise noted)

Symbol	Parameter		Rating	Unit
Common Ratings (T_A=25℃ Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage		±20	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		-50	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-50 ~ 150	°C
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested①	T_A=25°C	-0.52	A
I_D	Continuous Drain Current	T_A=25°C	-0.13	A
P_D	Maximum Power Dissipation	T_A=25°C	0.225	W
		T_A=70°C	0.15	
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		556	°C/W

Electrical Characteristics (Ta=25°C unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=-250μA	-50			V
I_{DSS}	Zero Gate Voltage Drain Current(T_A=25℃)	V_{DS}=-50V, V_{GS}=0V			-15	μA
	Zero Gate Voltage Drain Current(T_A=25℃)	V_{DS}=-25V, V_{GS}=0V			-0.1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V			±5	uA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-0.9	-1.6	-2	V
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=-5V, I_D=-0.1A		5.8	10	Ω
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=-10V, I_D=-0.1A		4.5	8	Ω
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=5V, V_{GS}=0V, f=1MHz		30		pF
C_{oss}	Output Capacitance			10		pF
C_{rss}	Reverse Transfer Capacitance			5		pF
Switching Characteristics						
$t_{d(on)}$	Turn on Delay Time	V_{DD}=-15V, I_D=-2.5A, R_L=50Ω,		2.5		ns
t_r	Turn on Rise Time			1		ns
$t_{d(off)}$	Turn Off Delay Time			16		ns
t_f	Turn Off Fall Time			8		ns
Source Drain Diode Characteristics						
I_{SD}	Source drain current(Body Diode)	T_A=25℃			-0.13	A
V_{SD}	Forward on voltage②	T_j=25℃, I_{SD}=0.13A, V_{GS}=0V			-2.2	V

Notes:

① Pulse width limited by maximum allowable junction temperature

② Pulse test ; Pulse width≤300μs, duty cycle≤2%.

Characteristic Curves

Fig1. Typical Output Characteristics

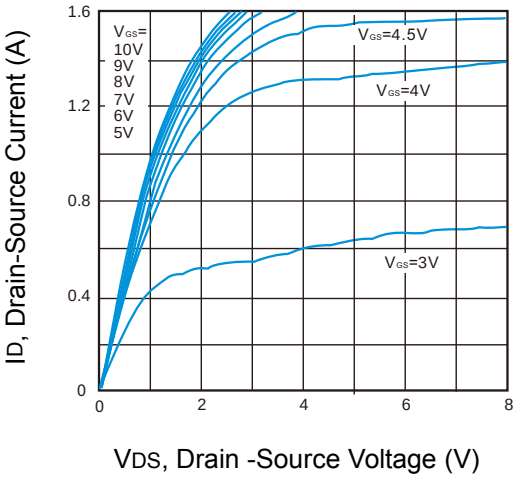


Fig2. Normalized Threshold Voltage Vs Temperature

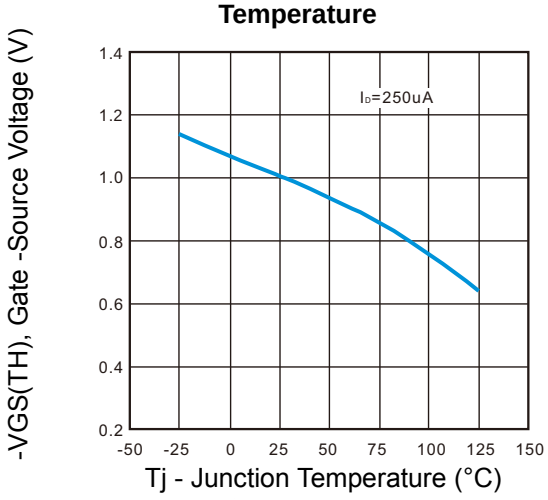


Fig3. Typical Transfer Characteristics

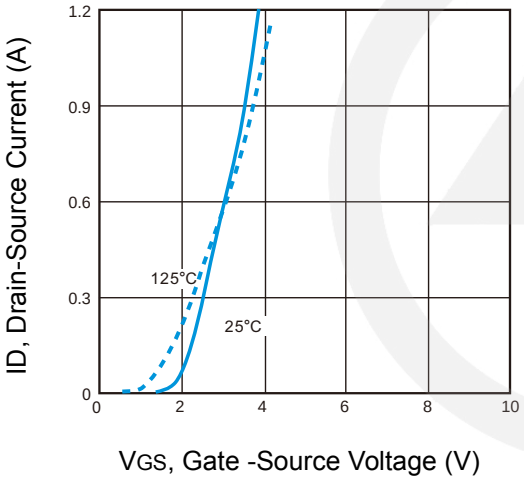


Fig4. Drain -Source Voltage vs Gate -Source Voltage

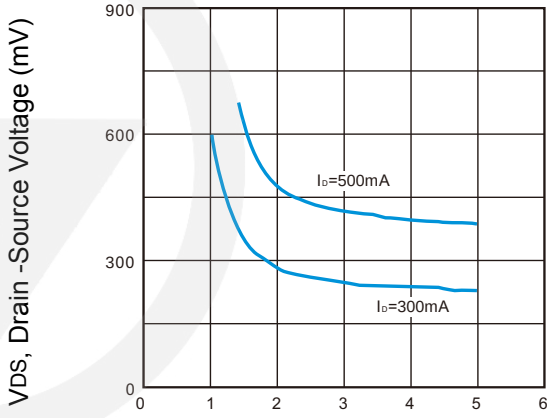


Fig5. Typical Source-Drain Diode Forward Voltage

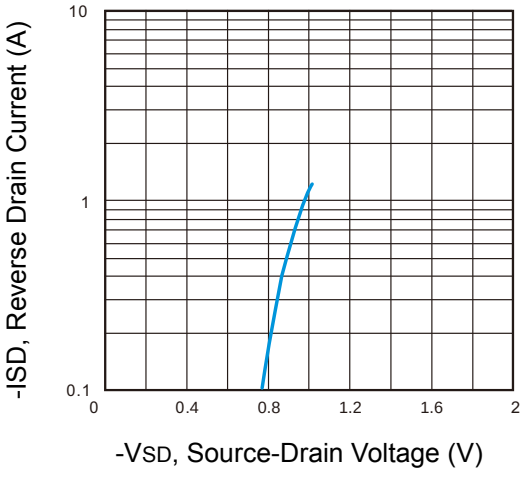


Fig6. Maximum Safe Operating Area

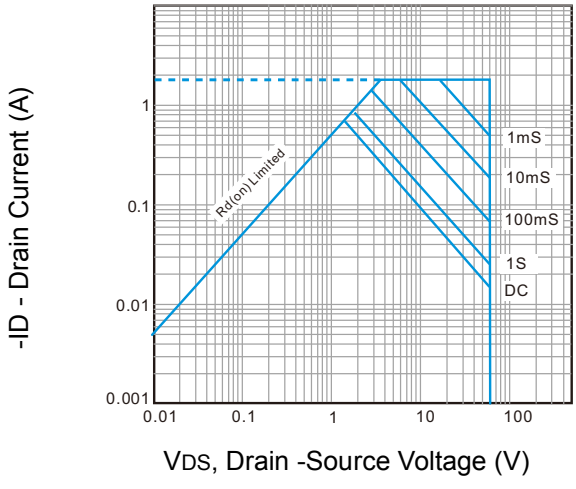


Fig7. Typical Capacitance Vs Drain-Source Voltage

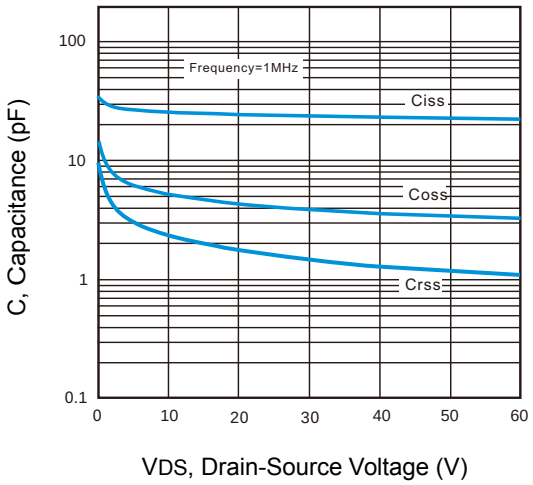
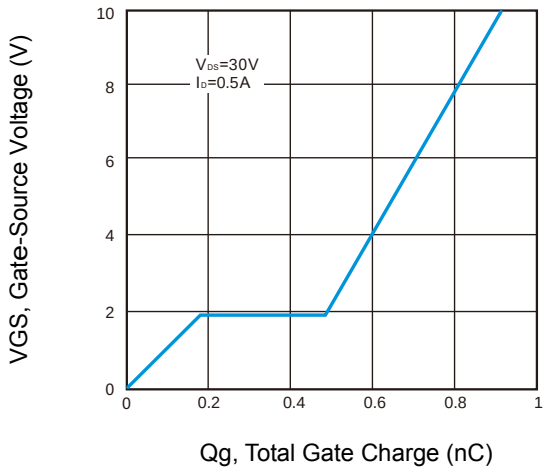
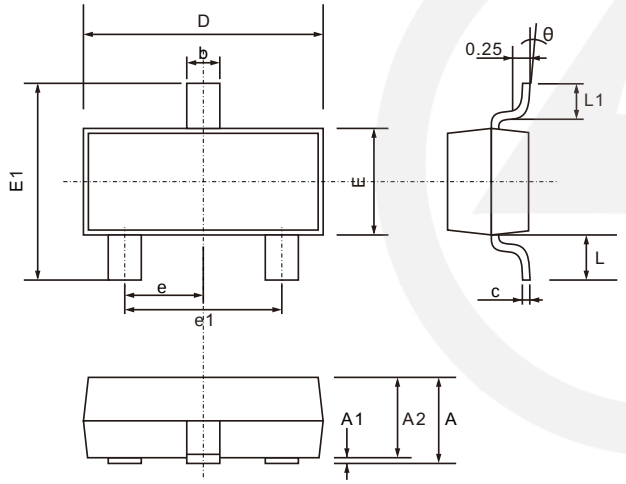


Fig8. Typical Gate Charge Vs Gate-Source Voltage



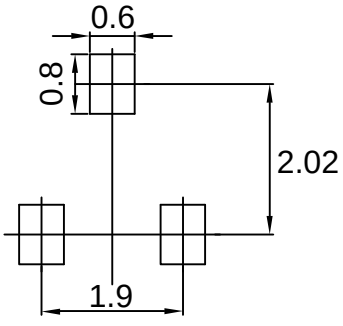
SOT-23 Package Outline



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°

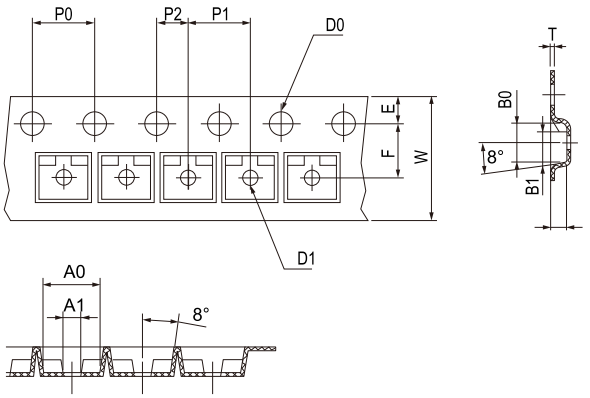
SOT-23 Suggested Pad Layout



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

Carrier Tape Dimensions

Unit：mm

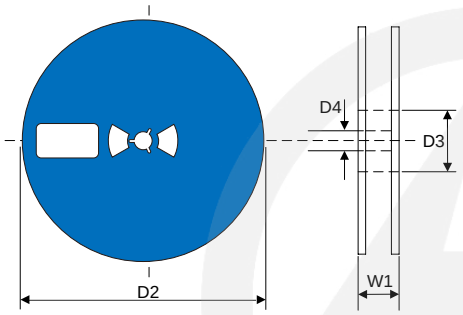


Symbol	Spec	Symbol	Spec
A0	3.15±0.10	P0	4.00±0.05
A1	1.09±0.10	P1	4.00±0.02
B0	2.77±0.10	W	8.00±0.10
B1	2.15±0.10	E	1.75±0.10
K0	1.22±0.10	F	3.50±0.05
D0	1.50±0.10	T	2.00±0.10
D1	1.00±0.10		

Reel Dimensions

Unit：mm

7” Reel

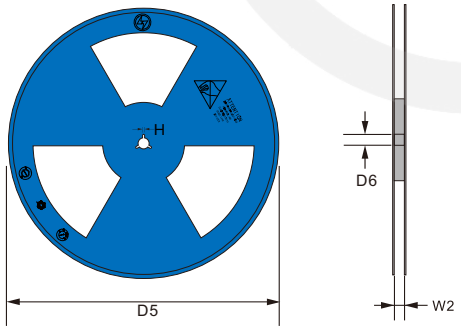


D2	Φ178.0±2.0
D3	Φ50
D4	13.0±0.5
W1	12±0.5
Quantity: 3000PCS	

Reel Dimensions

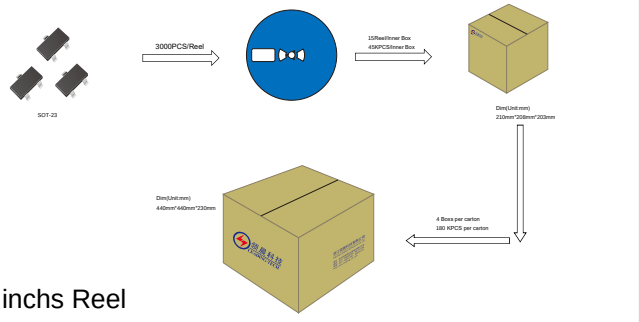
Unit：mm

13” Reel

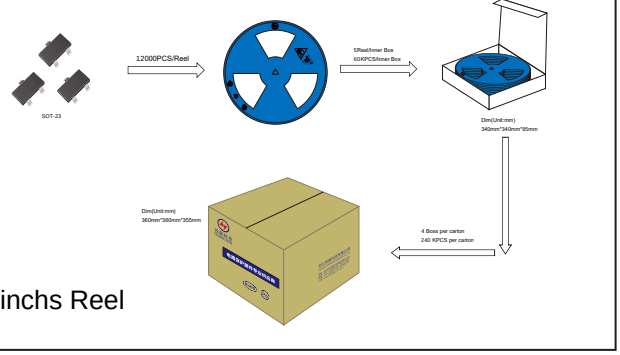


D5	Φ330.0±2.0
D6	Φ13.5±0.5
H	2.5±1.0
W2	12±0.5
Quantity: 12000PCS	

Packaging



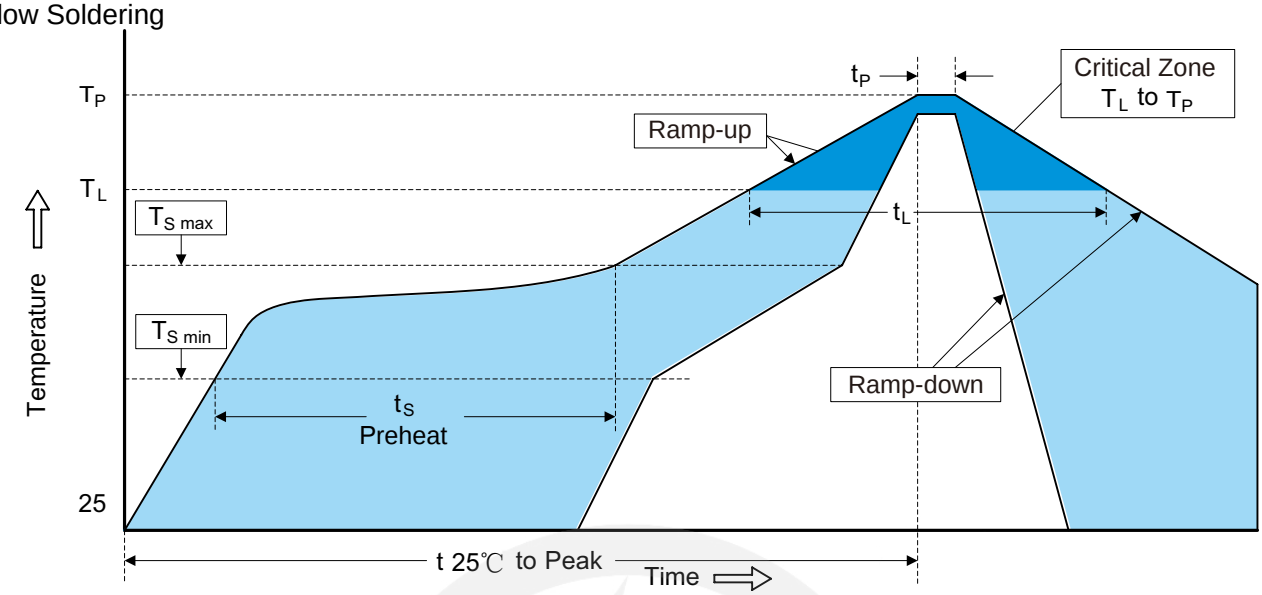
7 inchs Reel



13 inchs Reel

Recommended Soldering Conditions

Reflow Soldering



Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3℃/second max.
Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) (t_S)	 150℃ 200℃ 60-180 seconds
$T_{S\ max}$ to T_L -Ramp-up Rate	 3℃/second max.
Time maintained above: -Temperature (T_L) -Time (t_L)	 217℃ 60-150 seconds
Peak Temperature (T_P)	260℃
Time within 5℃ of actual Peak Temperature (t_P)	20-40 seconds
Ramp-down Rate	6℃/second max.
Time 25℃ 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	2024.3.18	2024.3.18	3.0	New file	/	Ding	
02	2025.06.16	2025.06.16	3.1	Update packaging information	/	Ding	
03	2026.03.05	2026.03.05	3.2	Package outline E1(max)=2.6mm	/	Ding	