

Description

The SP2305-S03T uses advanced trench technology to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use as a load switch or in PWM applications.

Features

- V_{DS} -30V
- I_D ($V_{GS}=-10V$) -4.2A
- $R_{DS(ON)}$, $V_{GS}@-10V$, $I_D@-4.2A=70m\Omega$
- $R_{DS(ON)}$, $V_{GS}@-4.5V$, $I_D@-4.0A=80m\Omega$
- $R_{DS(ON)}$, $V_{GS}@-2.5V$, $I_D@-1.0A=130m\Omega$

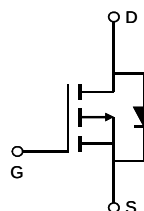
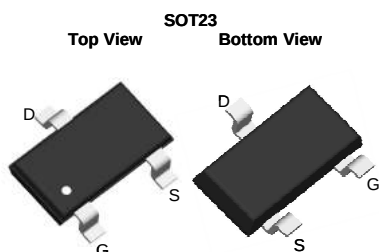
Deice Marking and Ordering Information

Deceive	Making	Shipping
SP2305-S03T	P05	3000/Tape&Reel

Applications

- DC/DC converters
- Supply line switching
- Battery charger
- LCD backlighting

Circuit Diagram & Pin Configuration



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

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	B_{VDSS}	-30	V
Gate-to-Source Voltage	V_{GS}	± 14	V
Drain Current	I_D	-4.2	A
Continuous $T_A=25^\circ C$	I_{DM}	-30	A
Pulsed(Note 1)			
Power Dissipation	P_D	1.4	W
Thermal Resistance	$R_{\theta JA}$	140	$^\circ C/W$
Junction-to-Ambient(Note 2)			
Junction and Storage temperature	T_J, T_{STG}	-55~150	$^\circ C$

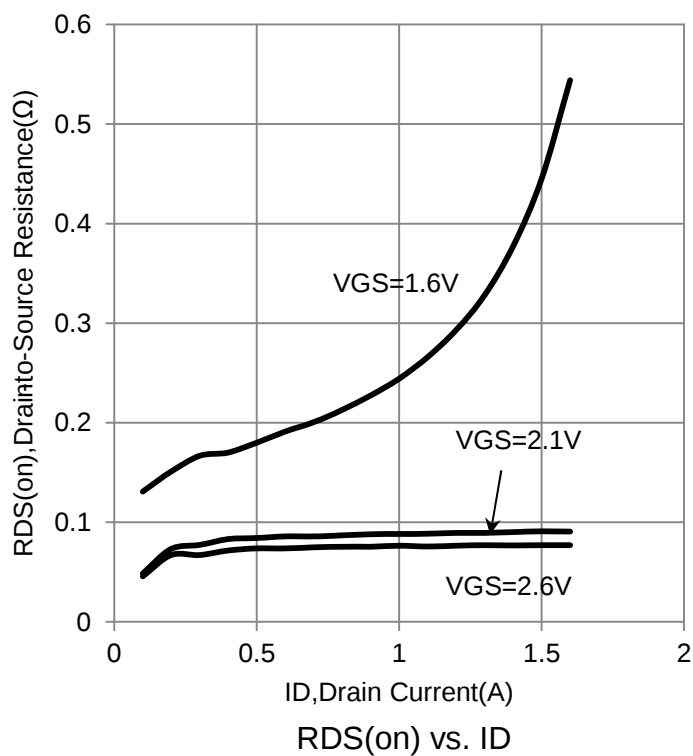
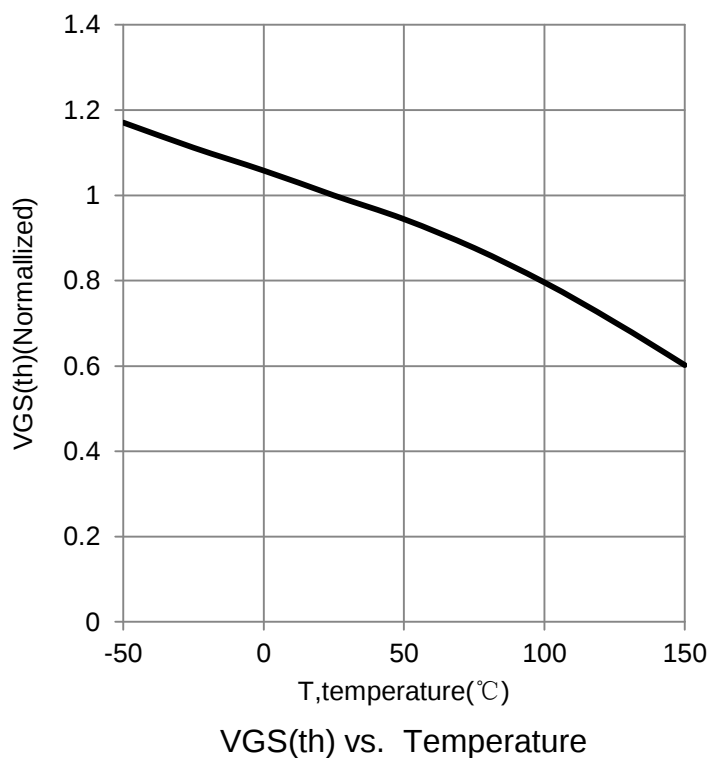
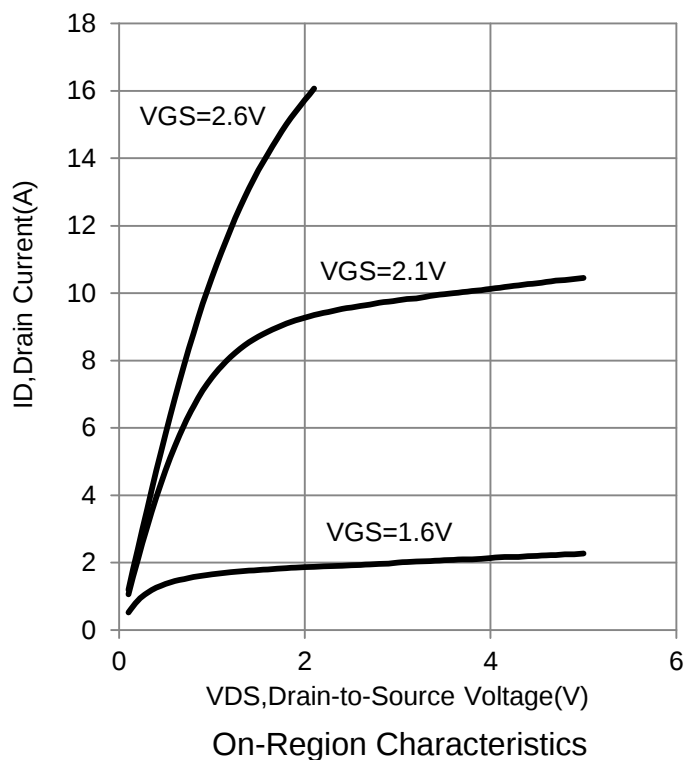
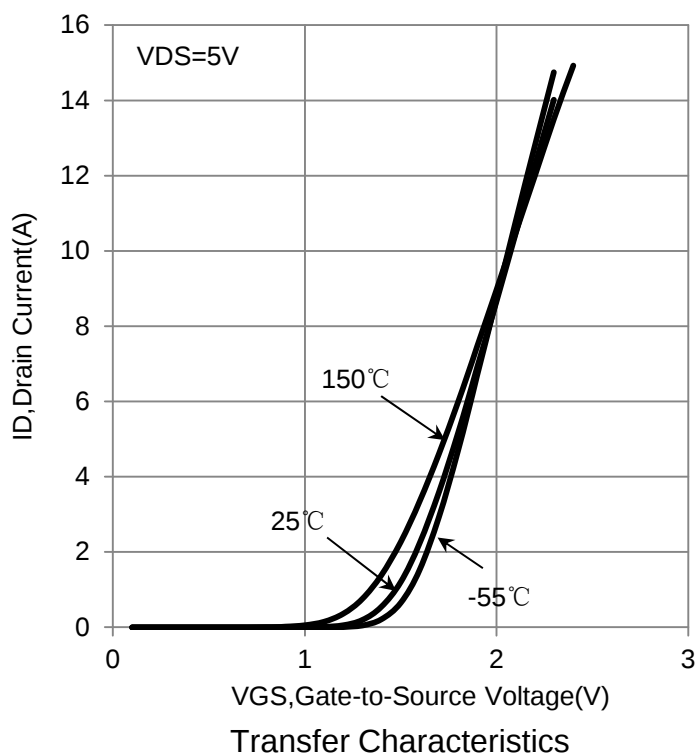
1. Repetitive Rating: Pulse width limited by the maximum junction temperature.

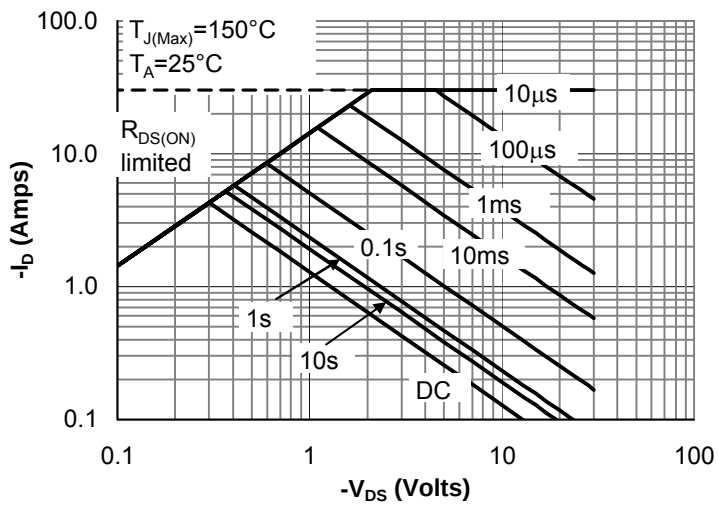
2. 1-in² 2oz Cu PCB board.

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

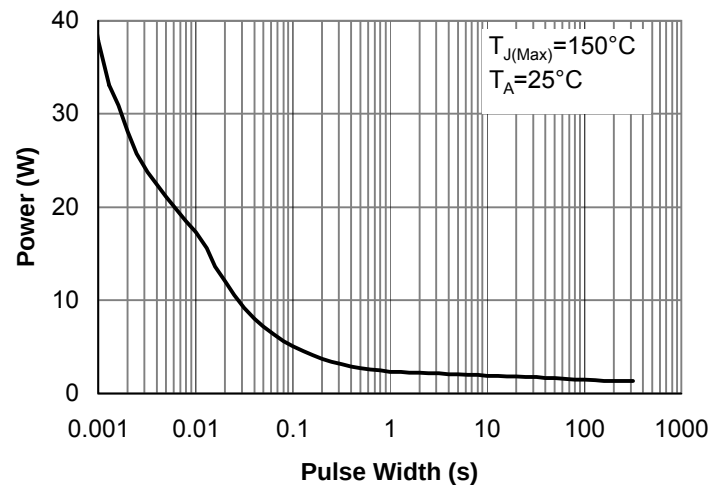
Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
B _{VDSS}	Drain-Source Breakdown Voltage	I _D =-250uA, V _{GS} =0V	-30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-24V, V _{GS} =0V			-1	μA
I _{GSS}	Gate-Body leakage current	V _{DS} =0V, V _{GS} = ±14V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	-0.7		-1.3	V
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-4.2A		53	70	mΩ
		V _{GS} =-4.5V, I _D =-4.0A		64	85	
		V _{GS} =-2.5V, I _D =-1.0A		86	130	
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-4.2A	7.0	11		S
V _{SD}	Diode Forward Voltage	I _S =-1A, V _{GS} =0V			-1.0	V
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-15V, f=1MHz		826		pF
C _{oss}	Output Capacitance			90		
C _{rss}	Reverse Transfer Capacitance			53		
SWITCHING PARAMETERS						
T _{d(on)}	Turn-On Delay Time	V _{DD} = -15V, R _L = 3.6Ω I _D = -1A, V _{GEN} = -10V R _G = 6Ω)		11.3		ns
tr	Turn-On Rise Time			2.3		
Td(off)	Turn-Off Delay Time			34.8		
tf	Turn-Off Fall Time			3.5		

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

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS


TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS


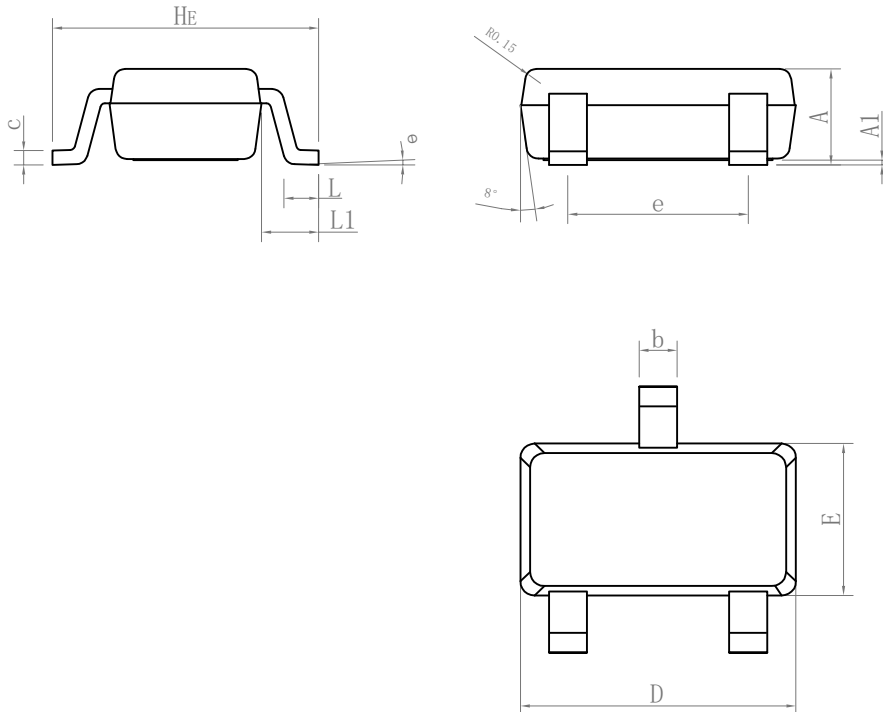
Maximum Forward Biased Safe
Operating Area



Single Pulse Power Rating Junction-to-
Ambient

OUTLINE AND DIMENSIONS

SOT23-LC

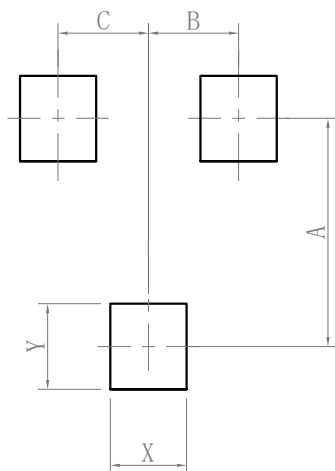


SOT23-LC			
DIM	MIN	NOR	MAX
A	0.90	1.00	1.10
A1	0.01	0.06	0.10
b	0.30	0.40	0.50
c	0.10	0.15	0.20
D	2.80	2.90	3.00
E	1.50	1.60	1.70
e	1.80	1.90	2.00
L	0.20	0.40	0.60
L1	0.45	0.60	0.75
HE	2.60	2.80	3.00
θ	0°	-	10°
All Dimensions in mm			

GENERAL NOTES

- 1.Top package surface finish $Ra0.4\pm0.2\mu m$
- 2.Bottom package surface finish $Ra0.7\pm0.2\mu m$
- 3.Side package surface finish $Ra0.4\pm0.2\mu m$

SOLDERING FOOTPRINT



SOT23-LC	
DIM	(mm)
X	0.80
Y	0.90
A	2.40
B	0.95
C	0.95