P3401-S03T

30V P-Channel Enhancement-Mode MOSFET

Description

The P3401-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<70mΩ
- $R_{DS(ON)}$, V_{GS}@-4.5V, I_D@-4.0A<80mΩ
- $R_{DS(ON)}$, V_{GS}@-2.5V, I_D@-1.0A<120mΩ

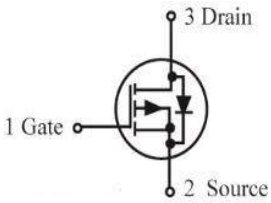
Deice Marking and Ordering Information

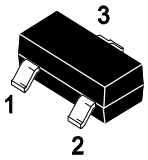
Deceive	Making	Shipping
P3401-S03T	A1	3000/Tape&Reel

Applications

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

Circuit Diagram & Pin Configuration





SOT23(TO-236)

Maximum Ratings (T_A=25℃)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	B_{VDSS}	-30	V
Gate-to-Source Voltage	V_{GS}	± 12	V
Drain Current Continuous T_A=25℃ Pulsed(Note 1)	 I_D I_{DM}	 -4.2 -30	 A
Power Dissipation	P_D	1.4	W
Thermal Resistance Junction–to–Ambient(Note 2)	$R_{\theta JA}$	140	℃/W
Junction and Storage temperature	T_J, T_{STG}	-55~150	℃

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

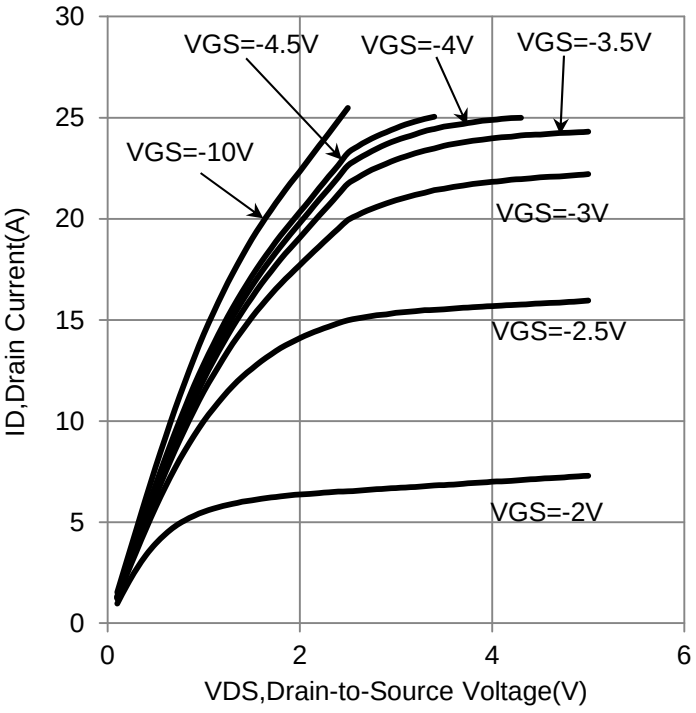
2. 1-in² 2oz Cu PCB board.

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

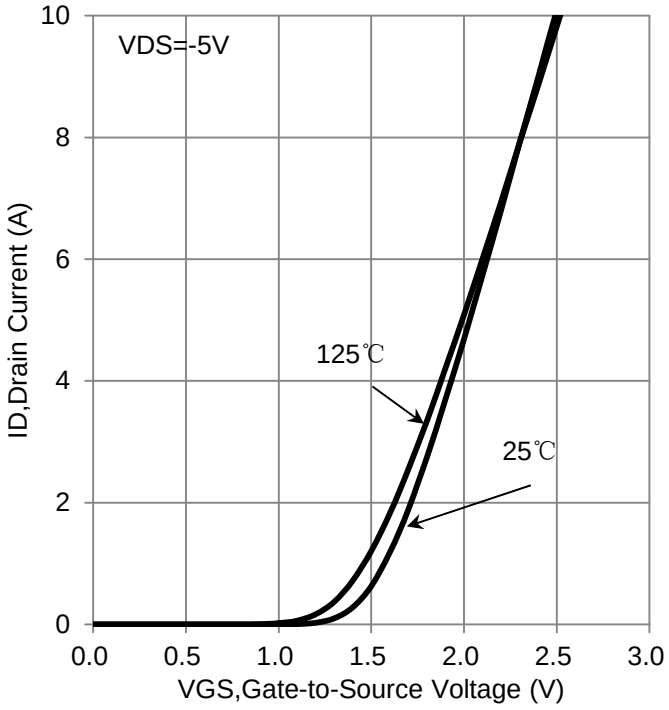
Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
B_{VDSS}	Drain-Source Breakdown Voltage	I_D=-250uA, V_{GS}=0V	-30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-24V, V_{GS}=0V			-1	μA
I_{GSS}	Gate-Body leakage current	V_{DS}=0V, V_{GS}= ±12V			±100	nA
$V_{GS(th)}$	Gate Threshold 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			70	mΩ
		V_{GS}=-4.5V, I_D=-4.0A			85	
		V_{GS}=-2.5V, I_D=-1.0A			120	
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		954		pF
C_{oss}	Output Capacitance			115		
C_{rss}	Reverse Transfer Capacitance			77		
Q_g	Total Gate Charge	V_{DS} = -15V, V_{GS} = -4.5V, I_D = -4A		7.6		nC
Q_{gs}	Gate-Source Charge			1.3		
Q_{gd}	Gate-Drain Charge			2.2		
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 ≤300 μs, Duty Cycle ≤2.0%.

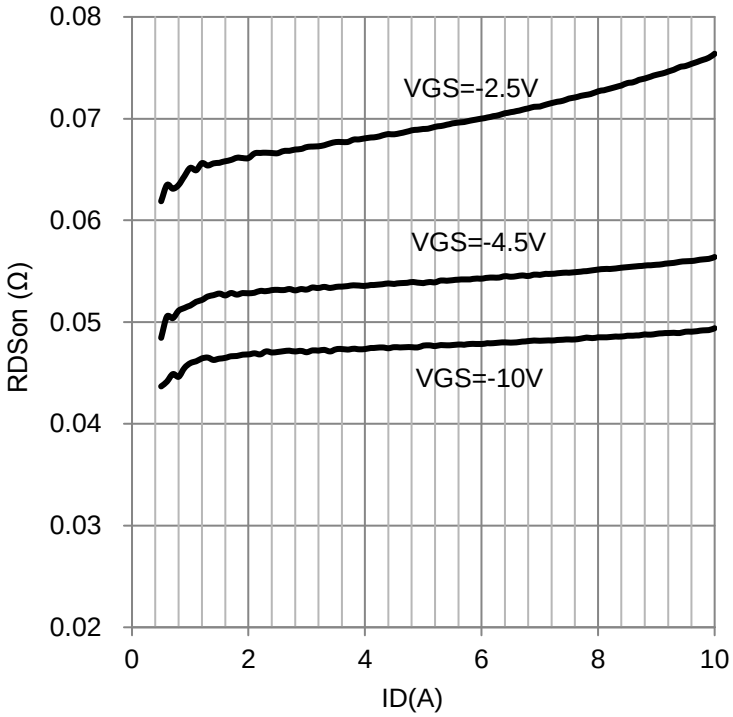
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



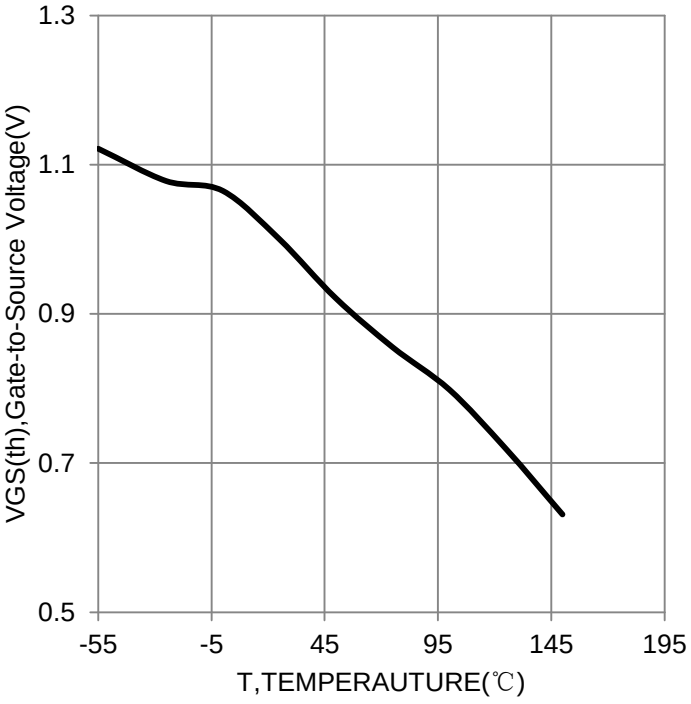
On-Region Characteristics



Transfer Characteristics

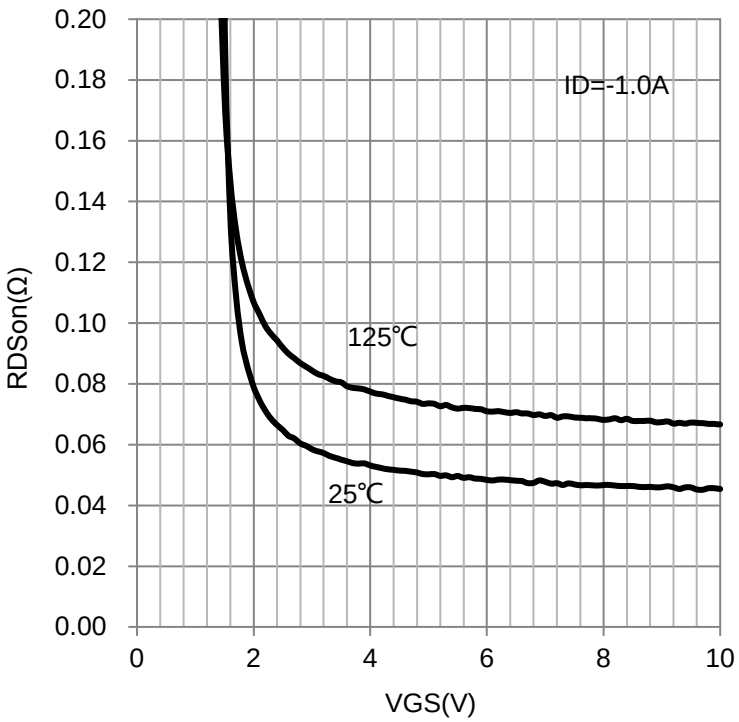


RDS(on) vs. ID

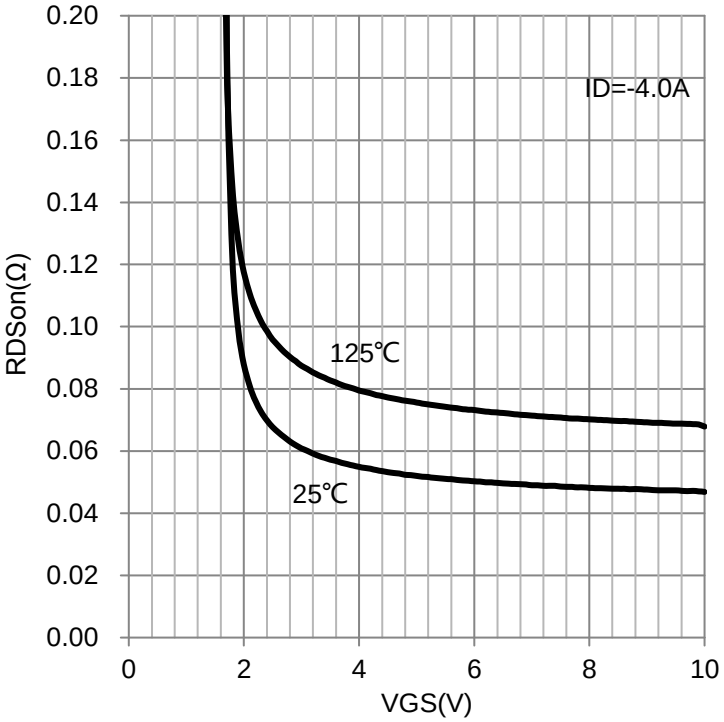


Temperature vs. Gate Threshold Voltage

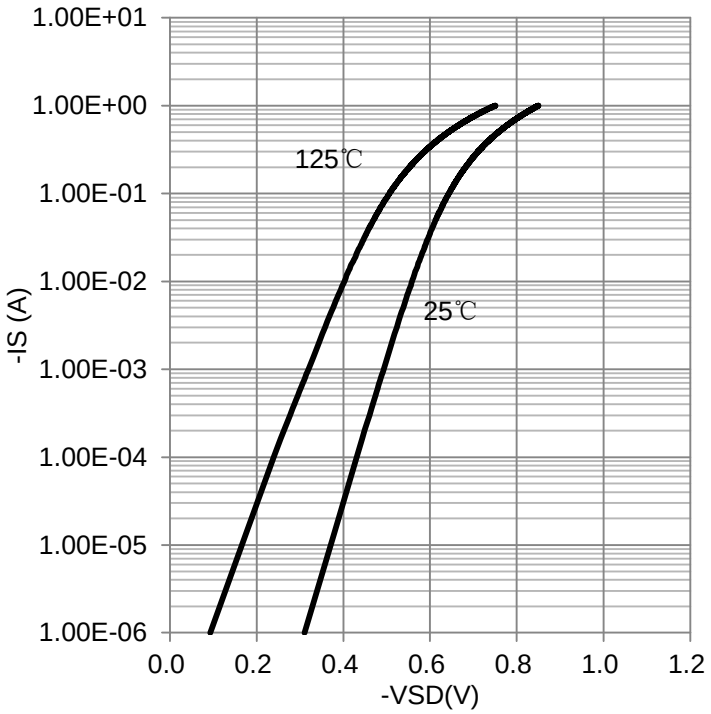
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



RDS(on) vs. VGS

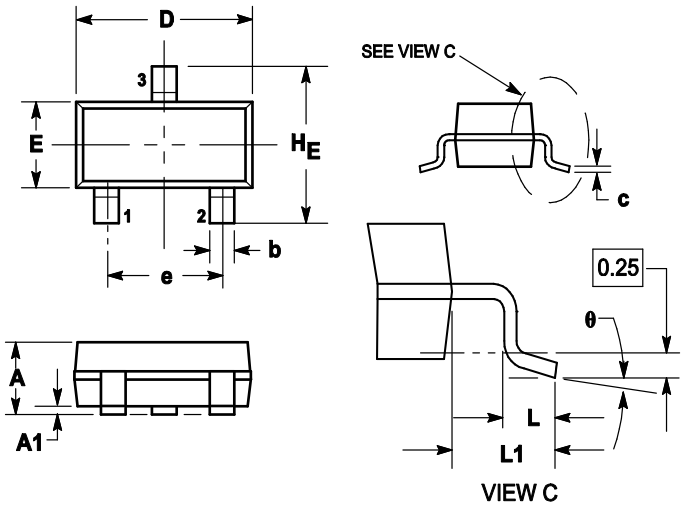


RDS(on) vs. VGS



Body Diode Characteristics

OUTLINE AND DIMENSIONS



Notes:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.89	1	1.11	0.035	0.04	0.044
A1	0.01	0.06	0.1	0.001	0.002	0.004
b	0.37	0.44	0.5	0.015	0.018	0.02
c	0.09	0.13	0.18	0.003	0.005	0.007
D	2.80	2.9	3.04	0.11	0.114	0.12
E	1.20	1.3	1.4	0.047	0.051	0.055
e	1.78	1.9	2.04	0.07	0.075	0.081
L	0.10	0.2	0.3	0.004	0.008	0.012
L1	0.35	0.54	0.69	0.014	0.021	0.029
H_E	2.10	2.4	2.64	0.083	0.094	0.104
θ	0°	---	10°	0°	---	10°

SOLDERING FOOTPRINT