

Features

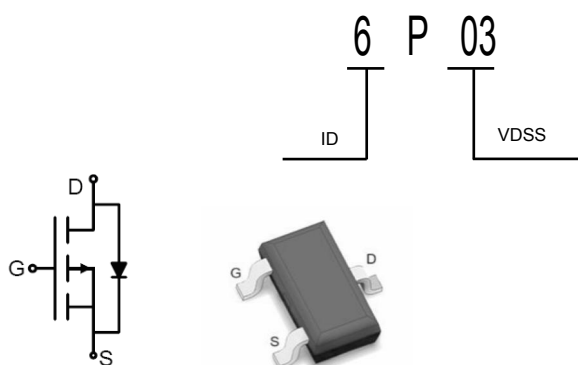
Low Gate Charge
100% UIS Tested, 100% DVDS Tested
High Power and current handling capability
Lead free product is acquired

V_{DS} -30 V
 I_D -6 A
 $R_{DS(ON)}$ 26m Ω

6P03

Application

DC/DC Converter
Ideal for high-frequency switching and synchronous rectification



Schematic Diagram

SOT-23-3L top view

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage ($V_{GS}=0V$)	-30	V
V_{GS}	Gate-Source Voltage ($V_{DS}=0V$)	± 20	V
I_D	Drain Current-Continuous($T_A=25^\circ\text{C}$)	-6	A
	Drain Current-Continuous($T_A=100^\circ\text{C}$)	-3.8	A
I_{DM} (pulse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	-24	A
P_D	Maximum Power Dissipation($T_A=25^\circ\text{C}$)	1.9	W
	Maximum Power Dissipation($T_A=100^\circ\text{C}$)	0.8	W
E_{AS}	Avalanche energy (Note 2)	36	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ\text{C}$

Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient		65	$^\circ\text{C}/\text{W}$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	-30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-30V, V _{GS} =0V T _J =25℃			-1	μA
		V _{DS} =-30V, V _{GS} =0V T _J =125℃			-100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	-2.5		-0.9	V
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-5A		9.3		S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-5A T _J =25℃		26	34	mΩ
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =-4.5V, I _D =-4A T _J =25℃		35	45	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-15V,V _{GS} =0V, f=1.0MHz		781		pF
C _{oss}	Output Capacitance			99		pF
C _{rss}	Reverse Transfer Capacitance			83		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz		4.4		Ω
Switching Parameters						
t _{d(on)}	Turn-on Delay Time	V _{GS} =-10V, V _{DS} =-15V, R _L =3Ω, R _{GEN} =3Ω		8		nS
t _r	Turn-on Rise Time			16		nS
t _{d(off)}	Turn-Off Delay Time			45		nS
t _f	Turn-Off Fall Time			33		nS
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-15V, I _D =-5A		8		nC
Q _{gs}	Gate-Source Charge			2		nC
Q _{gd}	Gate-Drain Charge			2		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current (Body Diode)				-6	A
V _{SD}	Forward on Voltage (Note 3)	V _{GS} =0V, I _S =-5A			-1.2	V
t _{rr}	Reverse Recovery Time	I _F =-5A, dI/dt=100A/μs		8		ns
Q _{rr}	Reverse Recovery Charge	I _F =-5A, dI/dt=100A/μs		3		nC

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

Notes 2.EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=-30V, V_G=10V, R_g=25\Omega, L=0.5\text{mH}$.

Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

RATING AND CHARACTERISTIC CURVES

Figure 1. Output Characteristics

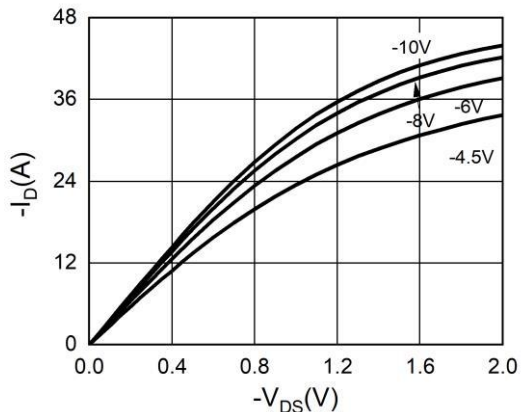


Figure 2. Transfer Characteristics

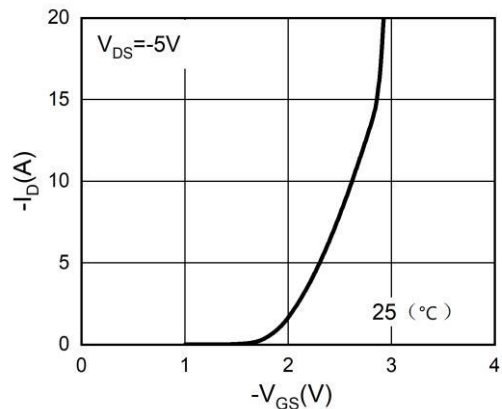


Figure 3. Power Dissipation

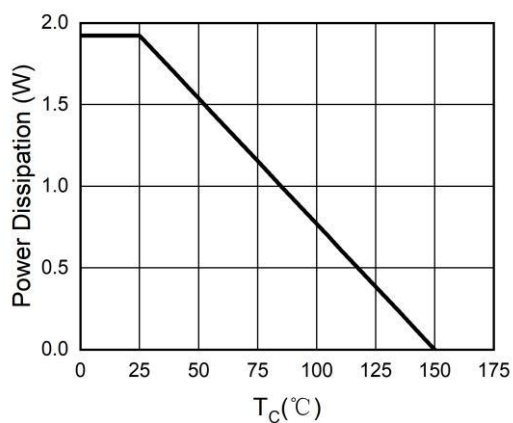


Figure 4. Drain Current

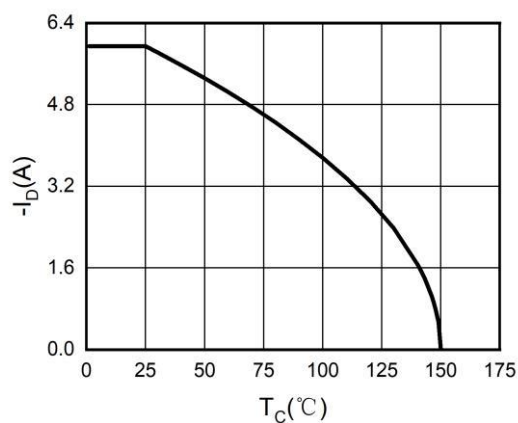


Figure 5. BV_{DSS} vs Junction Temperature

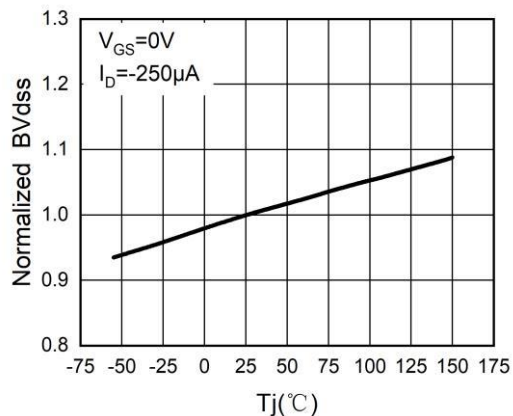
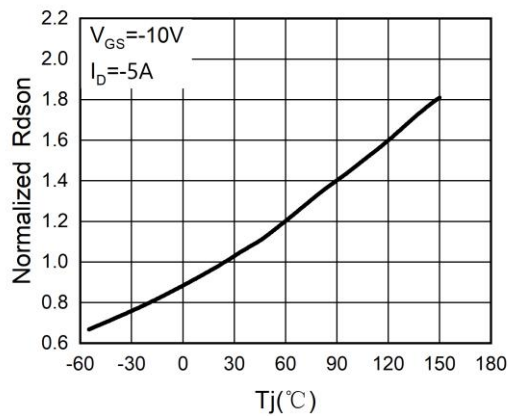


Figure 6. $R_{DS(ON)}$ vs Junction Temperature



RATING AND CHARACTERISTIC CURVES

Figure 7. Gate Charge Waveforms

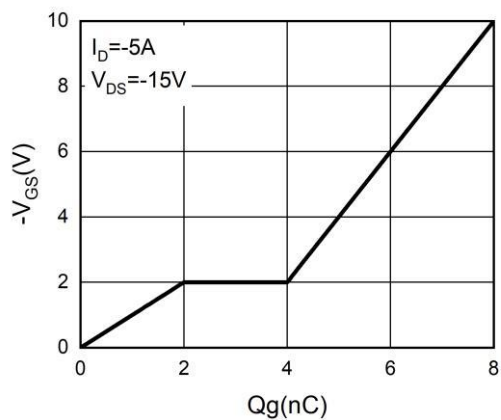


Figure 8. Capacitance

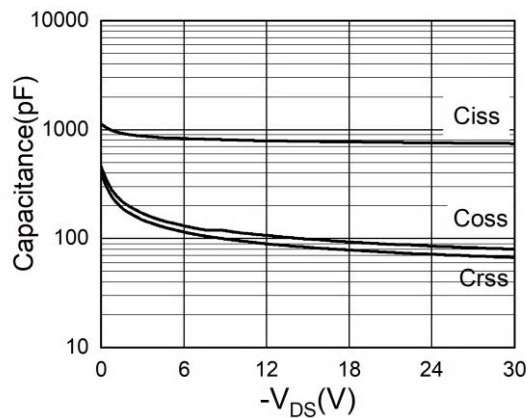


Figure 9. Body-Diode Characteristics

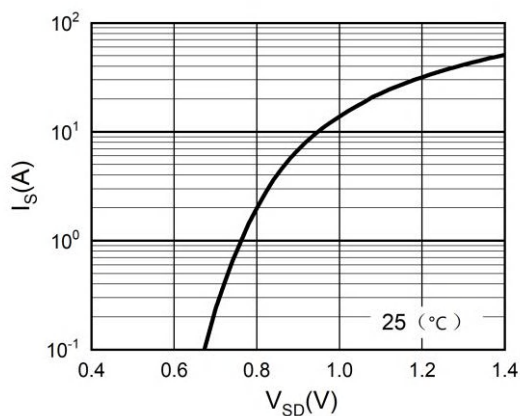
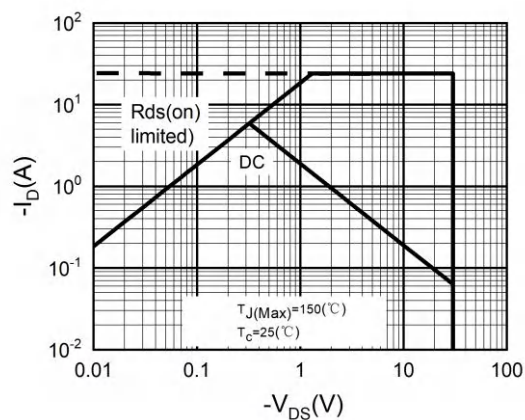
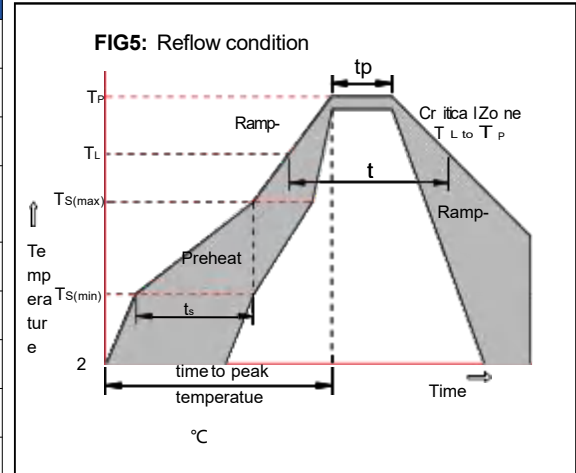


Figure 10. Maximum Safe Operating Area



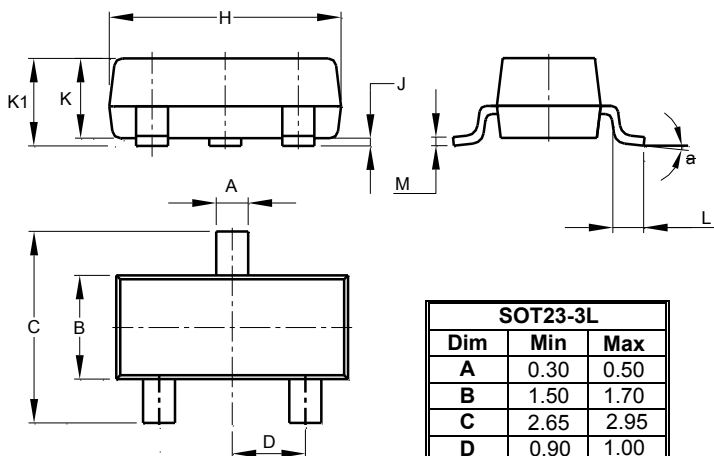
Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150 °C
	-Temperature Max($T_{s(max)}$)	+200 °C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3 °C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3 °C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217 °C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5) °C
Time within 5 °C of actual Peak Temp (t_P)		30 secs. Max
Ramp-down Rate		6 °C/sec. Max
Time 25 °C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260 °C

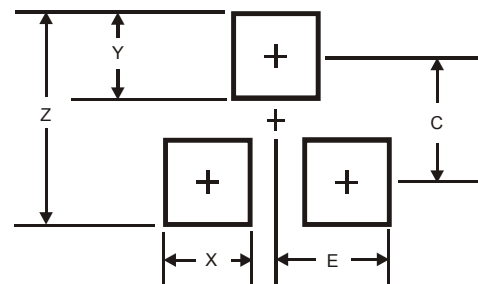


Package Dimensions & Suggested Pad Layout

SOT23-3L

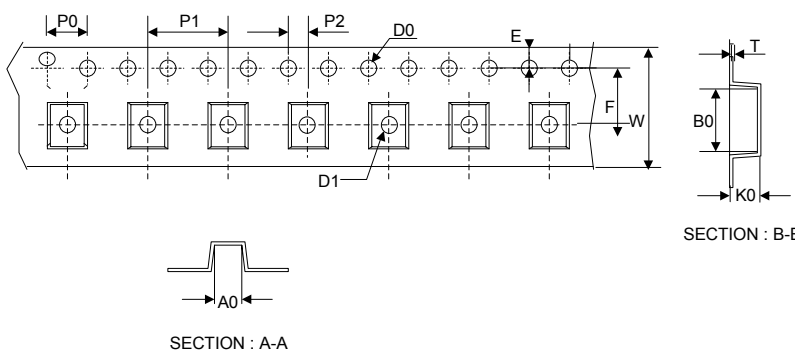
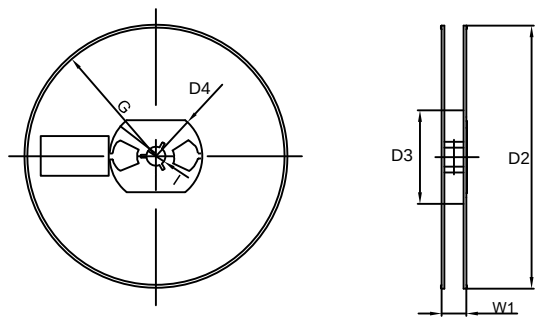


SOT23-3L		
Dim	Min	Max
A	0.30	0.50
B	1.50	1.70
C	2.65	2.95
D	0.90	1.00
H	2.82	3.02
J		0.10
K	1.05	1.15
K1	1.05	1.25
L	0.30	0.60
M	0.10	0.20
a	0°	8°
All Dimensions in mm		



Dimensions	SOT23-3L
Z	3.3
X	0.9
Y	1.0
C	2.3
E	1.40

Tape & reel specification

Tape		Symbol	Dimension (mm)
 SECTION : A-A SECTION : B-B		P0	4.00±0.20
		P1	4.00±0.20
		P2	2.00±0.20
		D0	1.55±0.20
		D1	1.05±0.20
		E	1.55±0.20
		F	3.60±0.20
		W	8.00±0.20
		A0	3.80±0.20
		B0	3.50±0.20
		K0	1.55±0.20
		T	0.25±0.15
		D2	178.0±5.0
		D3	55Min.
		D4	R24.0±3.0
7" Reel		G	R82.0±3.0
		I	13.0±2.0
		W1	11.0±3.0
		Quantity: 3000PCS	