GOODWORK
固得沃克

Professional semiconductor
device manufacturer

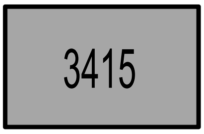
AO3415

P-Channel Enhancement Mode MOSFET

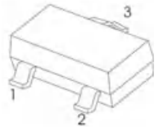
V_{DSS} -20 V
I_D -4.0 A
$R_{DS(ON)}$ 30 mΩ

FEATURES

- High density cell design for low $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability

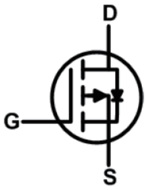


SOT-23



1. GATE
2. SOURCE
3. DRAIN

Equivalent Circuit



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Maximum ratings (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	
Continuous Drain Current (t≤10s)	I_D	-4.0	A
Maximum Power Dissipation (t≤10s)	P_D	1.2	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	357	℃/W
Operating Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~+150	℃

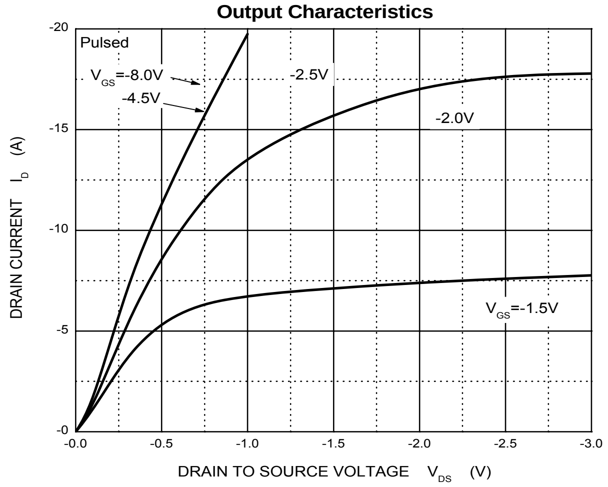
T_a=25℃ unless otherwise specified

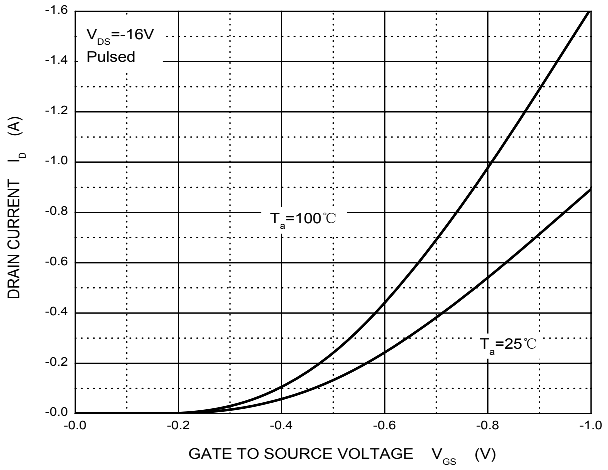
Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Static Parameters						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-20			V
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-0.3	-0.56	-1.2	
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±8V			±10	μA
		V_{DS} =0V, V_{GS} =±4.5V			±1	
Zero gate voltage drain current	I_{DSS}	V_{DS} =-16V, V_{GS} =0V			-1	
Drain-source on-state resistance(note1)	$R_{DS(on)}$	V_{GS} =-4.5V, I_D =-4A		0.030	0.045	Ω
		V_{GS} =-2.5V, I_D =-3A		0.038	0.060	
		V_{GS} =-1.8V, I_D =-2A		0.050	0.073	
Forward transconductance(note2)	g_{FS}	V_{DS} =-5V, I_D =-4A	8			S
Body diode voltage(note2)	V_{SD}	I_S=-1A,V_{GS} =0V			-1	V
Dynamic Parameters (note3)						
Input capacitance	C_{iss}	V_{DS} =-10V,V_{GS} =0V,f =1MHz		1450		pF
Output capacitance	C_{oss}			205		
Reverse transfer capacitance	C_{rss}			160		
Gate resistance	R_g	V_{DS} =0V,V_{GS} =0V,f =1MHz		6.5		Ω
Switching Parameters						
Total gate charge	Q_g	V_{DS} =-10V,V_{GS} =-4.5V,I_D =-4A		17.2		nC
Gate-Source charge	Q_{gs}			1.3		
Gate-drain charge	Q_{gd}			4.5		
Turn-on delay time (note3)	$t_{d(on)}$	V_{DS}=-10V, V_{GS}=-4.5V R_{GEN} =3Ω, R_L=2.5Ω,		9.5		ns
Turn-on rise time(note3)	t_r			17		
Turn-off delay time(note3)	$t_{d(off)}$			94		
Turn-off fall time(note3)	t_f			35		

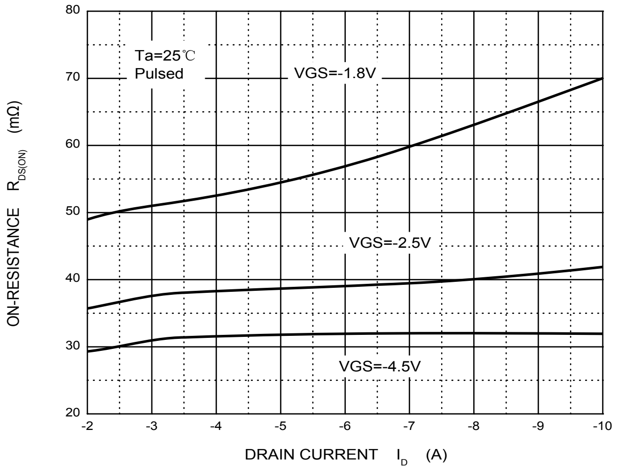
Notes:

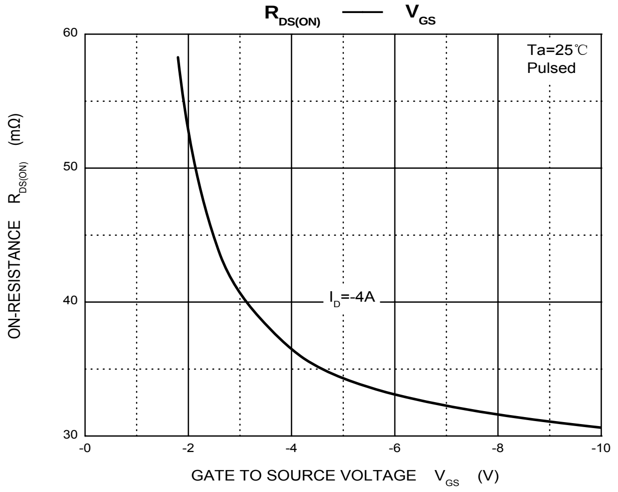
1. Repetitive rating,pulse width limited by junction temperature.
2. Pulse Test : Pulse width≦300μs, duty cycle≦2%.
3. These parameters have no way to verify.

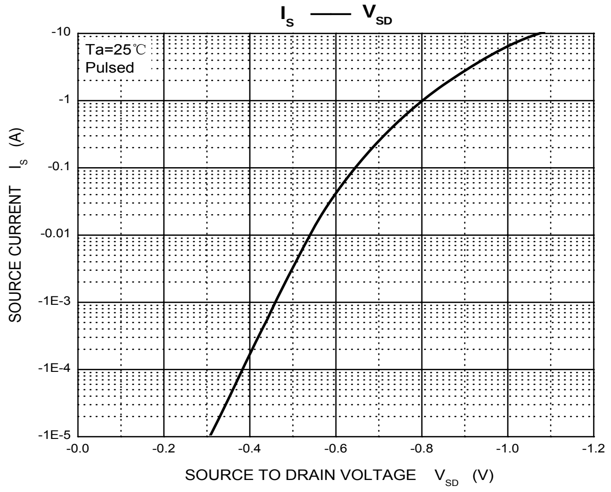
RATING AND CHARACTERISTIC CURVES

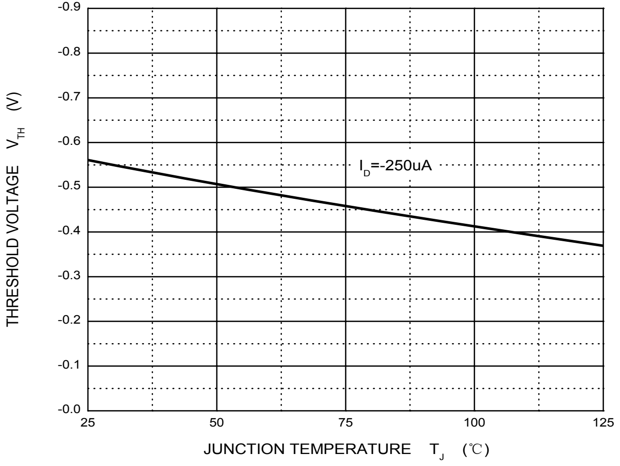

Output Characteristics


Transfer Characteristics


$R_{DS(ON)}$ — I_D


$R_{DS(ON)}$ — V_{GS}

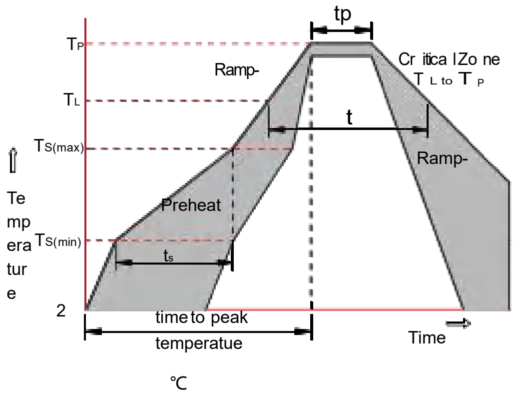

I_S — V_{SD}


Threshold Voltage

Soldering parameters

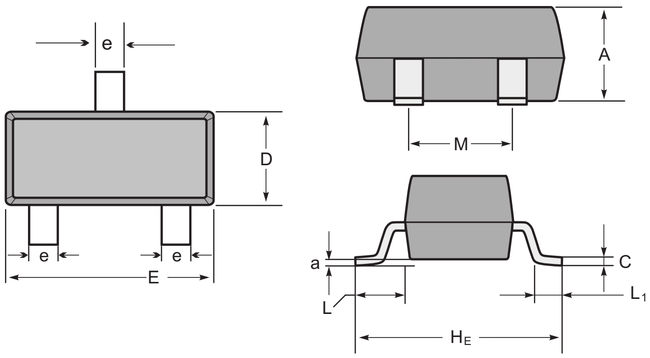
Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid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

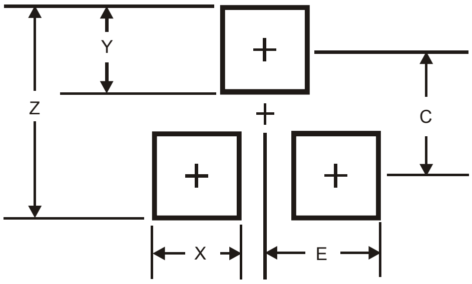
FIG5: Reflow condition



Package Dimensions & Suggested Pad Layout

SOT23





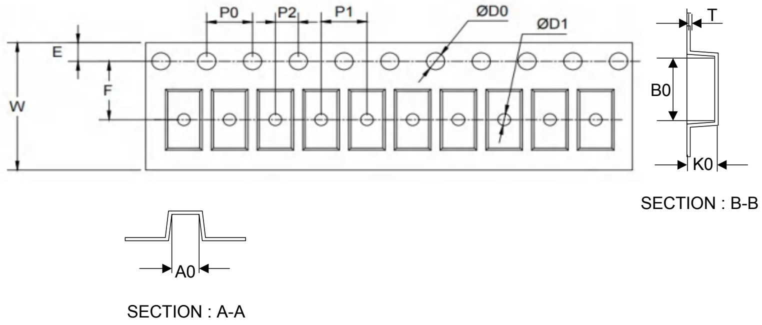
SOT-23 mechanical data

UNIT		A	C	D	E	HE	e	M	L	L1	a
mm	max	1.1	0.15	1.4	3.0	2.6	0.5	1.95	0.55 (ref)	0.36 (ref)	0.0
	min	0.9	0.08	1.2	2.8	2.2	0.3	1.7			0.15
mil	max	43	6	55	118	102	20	77	22 (ref)	14 (ref)	0.0
	min	35	3	47	110	87	12	67			6

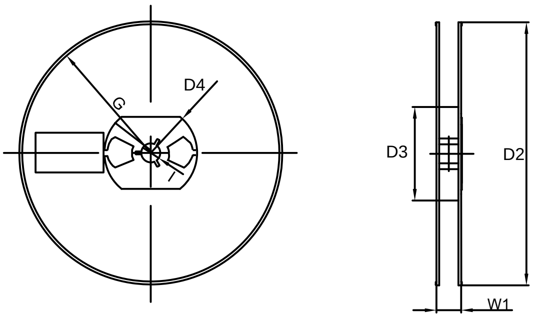
Dimensions	SOT23
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

Tape & rell specification

Tape



7” Reel



Symbol	Dimension (mm)
P0	4.00±0.10
P1	4.00±0.10
P2	2.00±0.10
D0	1.55±0.10
D1	1.05±0.10
E	1.55±0.10
F	3.60±0.10
W	8.00±0.10
A0	3.80±0.20
B0	3.25±0.20
K0	1.45±0.10
T	0.25±0.05
D2	178.0±3.0
D3	55Min.
D4	R24.0±3.0
G	R82.0±3.0
I	13.0±2.0
W1	11.0±3.0

Quantity: 3000PCS