FS3415K

P-Channel SMD MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-20V	45mΩ@-4.5V	-5.6A
	55mΩ@-2.5V	
	100mΩ@-1.8V	

Feature

- Advanced trench process technology
- High density cell design for ultra low on-resistance
- ESD Protected Up to 2.0KV (HBM)

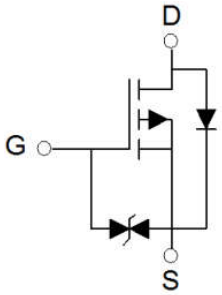
Application

- Load Switch for Portable Devices
- DC/DC Converter

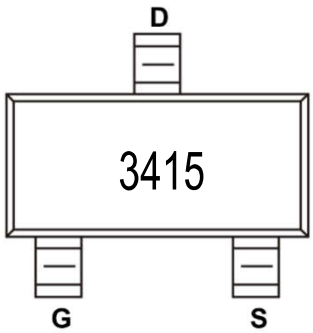
Package

SOT-23

Circuit diagram



Marking



Absolute maximum ratings (Ta=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current	I_D	-5.6	A
Pulsed Drain Current	I_{DM}	-23	A
Power Dissipation	P_D	1.3	W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_A=25 ºC, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-20			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-20V,V_{GS} = 0V			-1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±12V, V_{DS} = 0V			±15	μA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-0.4		-1	V
Drain-source on-resistance[1]	$R_{DS(on)}$	V_{GS} =-4.5V, I_D =-5.6A			45	mΩ
		V_{GS} =-2.5V, I_D =-4.3A			55	
		V_{GS} =-1.8V, I_D =-3.0A			100	
Dynamic characteristics[2]						
Input Capacitance	C_{iss}	V_{DS} =-10V,V_{GS} =0V,f =1MHz		940		pF
Output Capacitance	C_{oss}			219		
Reverse Transfer Capacitance	C_{rss}			116		
Total Gate Charge	Q_g	V_{DS} =-10V,V_{GS} =-4.5V, I_D =-4A		7.2		nC
Gate-Source Charge	Q_{gs}			1.2		
Gate-Drain Charge	Q_{gd}			1.6		
Turn-on delay time	$t_{d(on)}$	V_{DD}=-10V, V_{GS} =-4.5V, R_{GEN}=3Ω, R_L=2.5Ω		15		nS
Turn-on rise time	t_r			63		
Turn-off delay time	$t_{d(off)}$			21		
Turn-off fall time	t_f			12		
Source-Drain Diode characteristics						
Diode Forward Current[1]	I_S				-5.6	A
Diode Forward voltage	V_{DS}	V_{GS} =0V, I_S=-5.6A			-1.2	V

Notes:

1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.

2) Guaranteed by design, not subject to production testing.

Typical Performance Characteristics

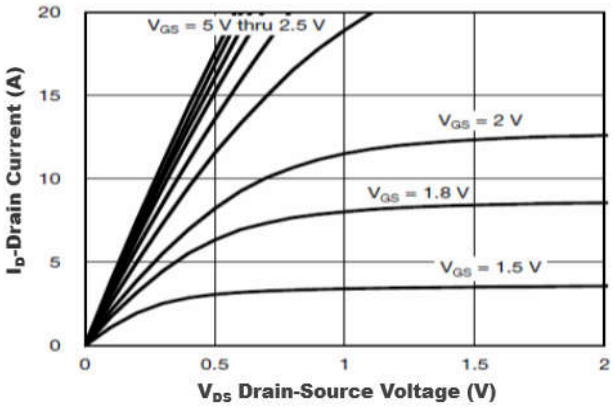


Figure1. Output Characteristics

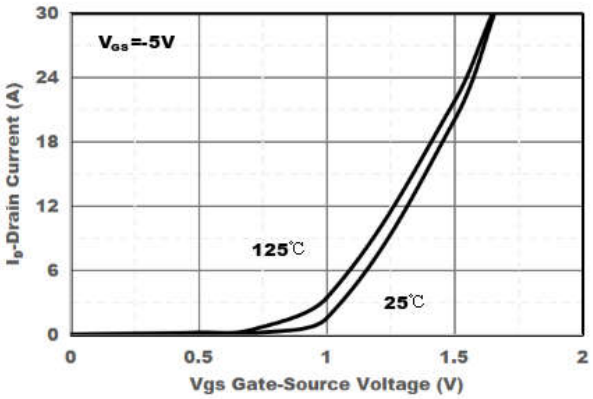


Figure2. Transfer Characteristics

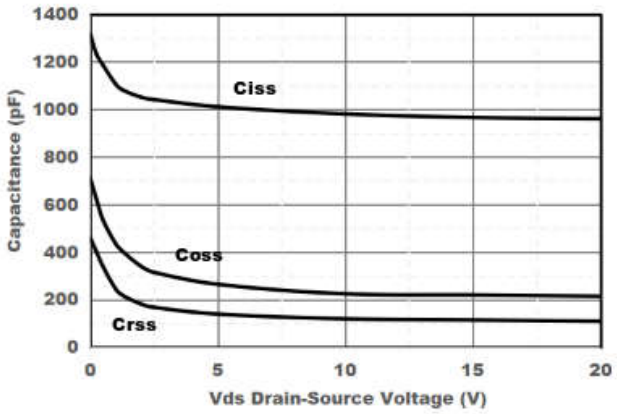


Figure3. Capacitance Characteristics

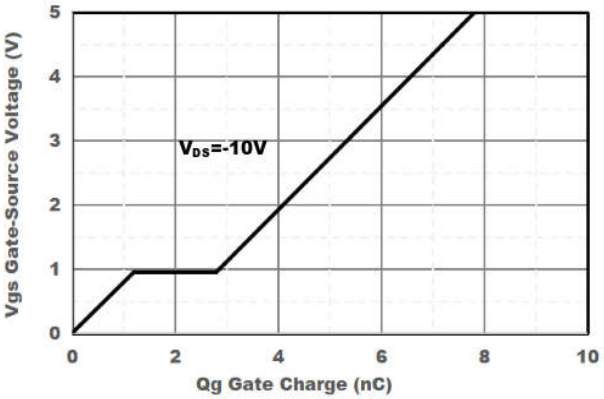


Figure4. Gate Charge

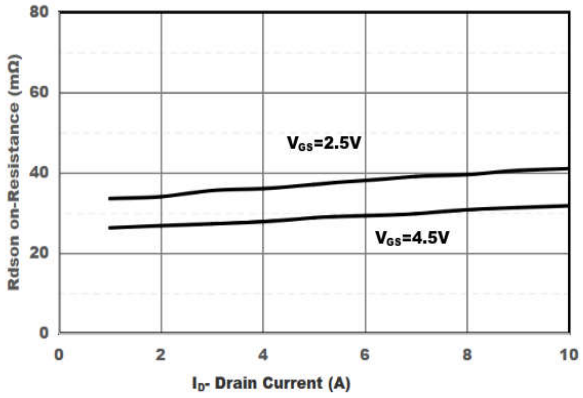


Figure5. Drain-Source on Resistance

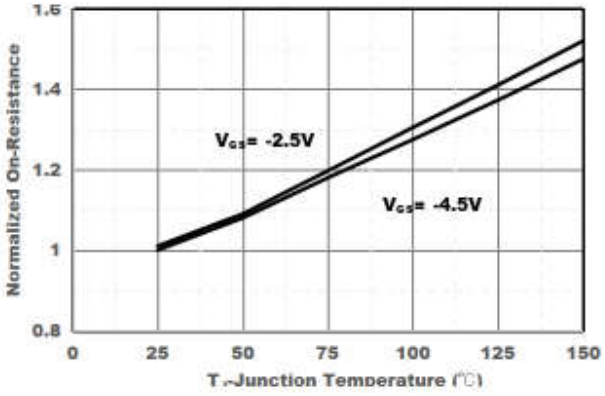
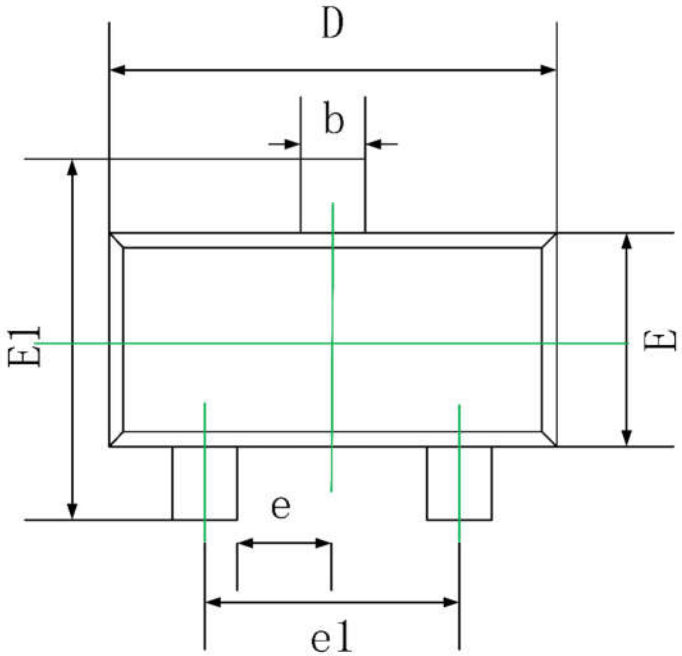
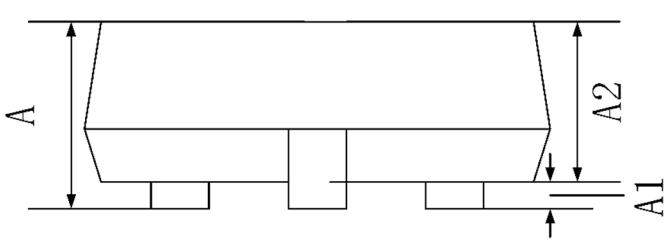
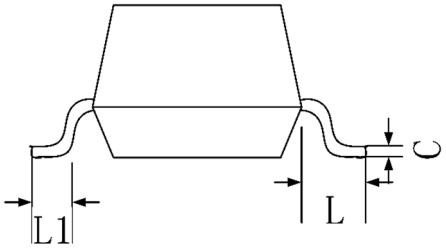


Figure6. Drain-Source on Resistance

SOT-23 Package Information



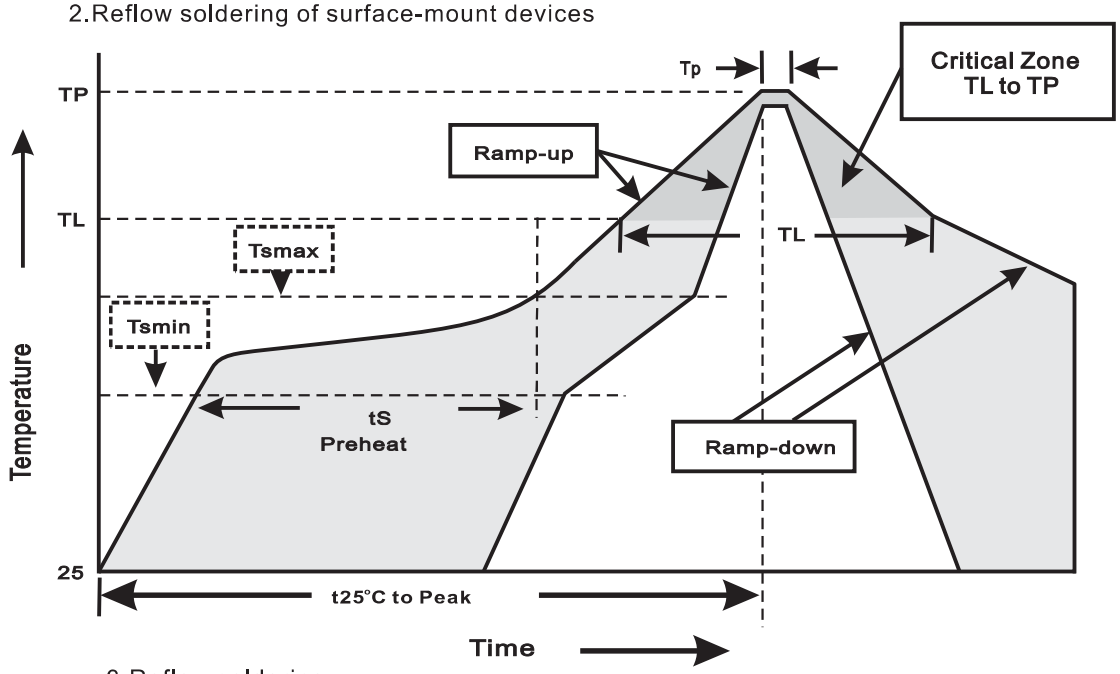




Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020

Suggested thermal profiles for soldering processes

1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T_L to T_P)	<3°C/sec
Preheat -Temperature Min(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(t_s)	 150°C 200°C 60~120sec
Tsmax to T_L -Ramp-upRate	 <3°C/sec
Time maintained above: -Temperature(T_L) -Time(t_L)	 217°C 60~260sec
Peak Temperature(T_P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t_P)	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes