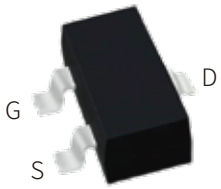
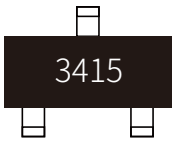
FEATURES

- V_{DS} = -16V , I_D = -7A
- $R_{DS(ON)}$ =22mΩ(Typ)@ V_{GS}=-4.5V
- $R_{DS(ON)}$ =35mΩ(Typ)@ V_{GS} =-2.5V
- ESD Rating：4000V HBM
- High Power and current handing capability
- Lead free product is acquired
- Surface mount package



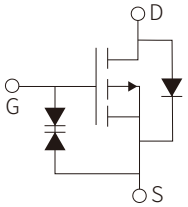
SOT-23



Marking

APPLICATION

- PWM application
- Load switch



Schematic Symbol

APPROVALS

RoHS	Compliance with 2011/65/EU
HF	Compliance with IEC61249-2-21:2003

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-16	V
Gate Threshold Voltage	V_{GS}	±10	V
Drain Current - Continuous	I_D	-7	A
Drain Current Pulsed (Note1)	I_{DM}	-24.8	A
Maximum Power Dissipation	P_D	1.5	W
Thermal Resistance Junction- to- Ambient (Note2)	$R_{\theta JA}$	88.7	°C/W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 to 150	°C

ELECTRICAL CHARACTERISTICS (Ta=25°C)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=-250μA	-16			V
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±10V,V_{DS}=0V			±10	μA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-16V,V_{GS}=0V			1	μA
On Characteristics(Note 3)						
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-0.45	-0.65	-1.0	V
Drain-Source On–State Resistance	$R_{DS(on)}$	V_{GS}=-4.5V,I_D=-4A		22	30	mΩ
		V_{GS}=-2.5V,I_D=-4A		35	48	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-4A		21		S
Dynamic Characteristics(Note 4)						
Input Capacitance	C_{iss}	V_{DS}=-10V,V_{GS}=0V,f=1MHz		580		pF
Output Capacitance	C_{oss}			184		pF
Reverse Transfer Capacitance	C_{rss}			106		pF
Switching Characteristics(Note 4)						
Turn–on Delay Time	$t_{d(on)}$	V_{DD}=-10V,R_L=2.5Ω V_{GS}=-4.5V,R_{GEN}=3Ω		9.8		ns
Turn–on Rise Time	t_r			17		ns
Turn–Off Delay Time	$t_{d(off)}$			94		ns
Turn–off Fall Time	t_f			35		ns
Total Gate Charge	Q_{gs}	V_{DS}=-10V,I_D=-4A V_{GS}=-4.5V		17.2		nC
Gate-Source Charge	Q_{gs}			1.3		nC
Gate-Drain Charge	Q_{gd}			4.5		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage(Note 3)	V_{DS}	V_{GS}=0V,I_S=-1A		-0.79	-1	V
Diode Forward Current(Note 2)	I_S				-2.2	A

Notes:
1. Repetitive rating : Pulse width limited by junction temperature
2.Surface Mounted on FR4 Board t≤10sec.
3. Pulse width ≤300us, duty cycle ≤2%.
4. Guaranteed design, not subject to production testing.

PARAMETER CHARACTERISTIC CURVE

Figure1: Switching Test Circuit

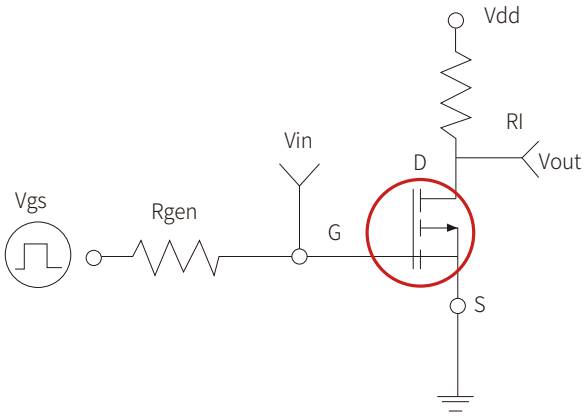


Figure2: Switching Waveforms

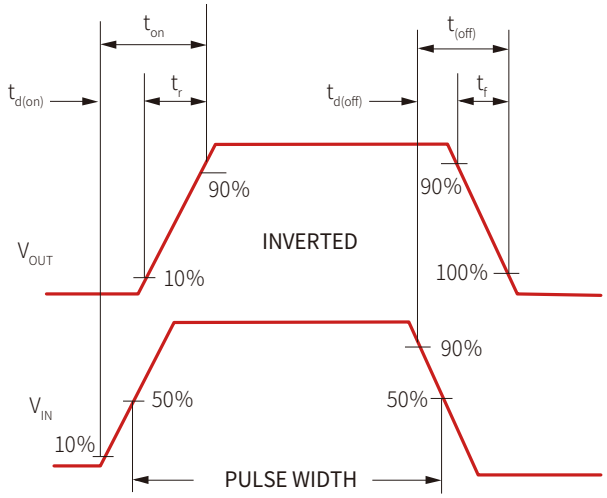


Figure3: Power Dissipation

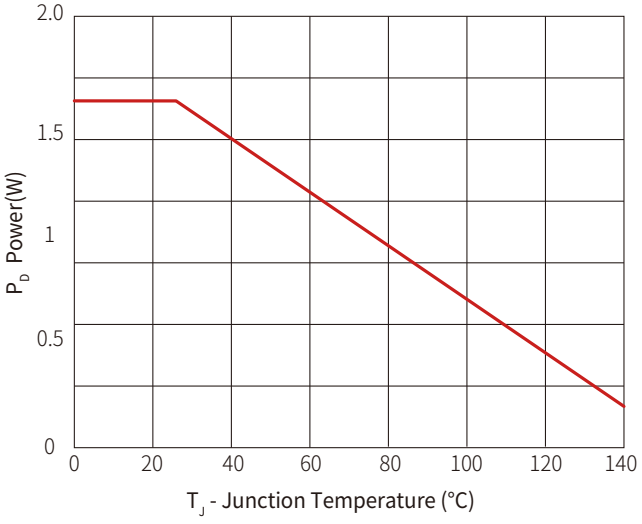


Figure 4: Safe Operation Area

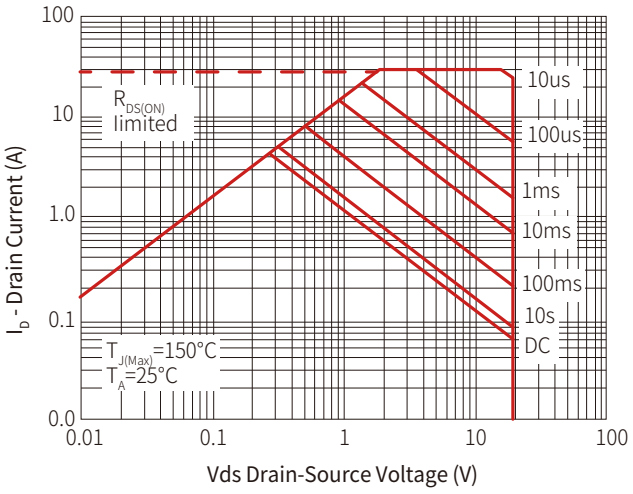


Figure 5: Output Characteristics

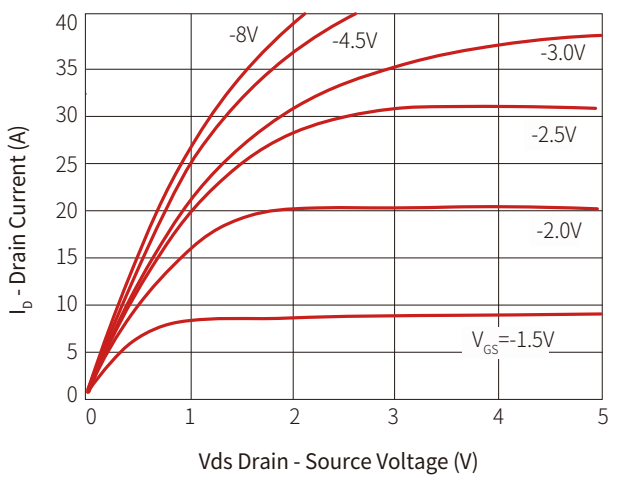


Figure 6: Drain-Source On-Resistance

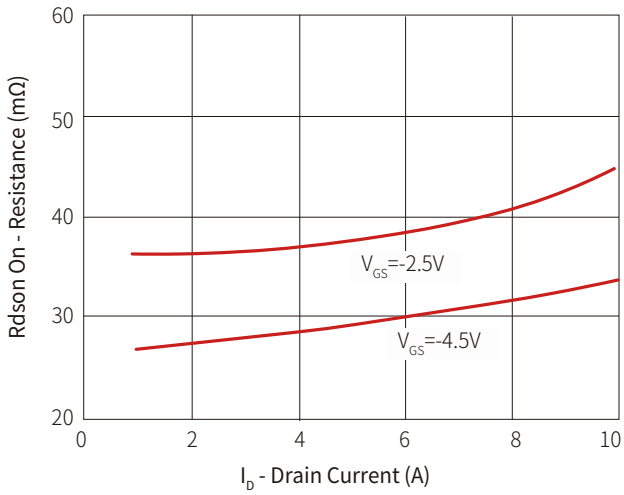


Figure 7: Transfer Characteristics

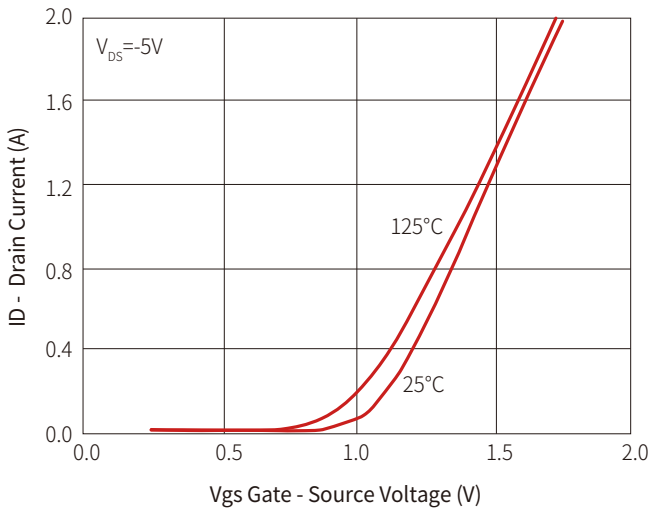


Figure 8: Drain-Source On-Resistance

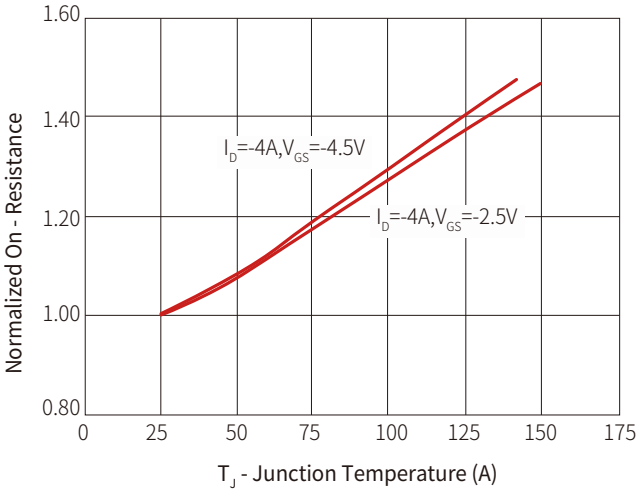


Figure 9: Rdson vs Vgs

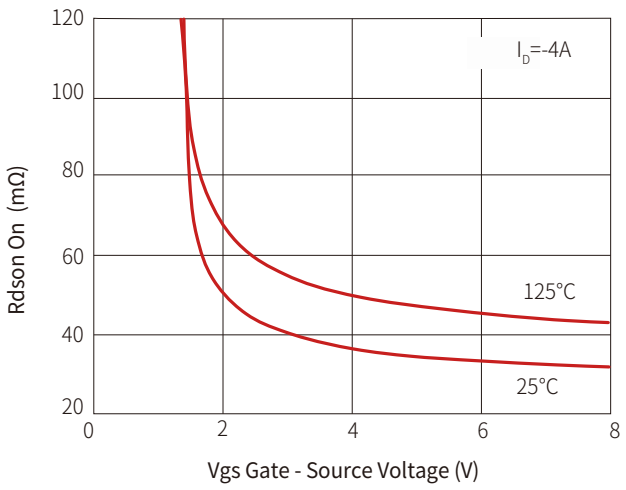


Figure 10: Capacitance vs Vds

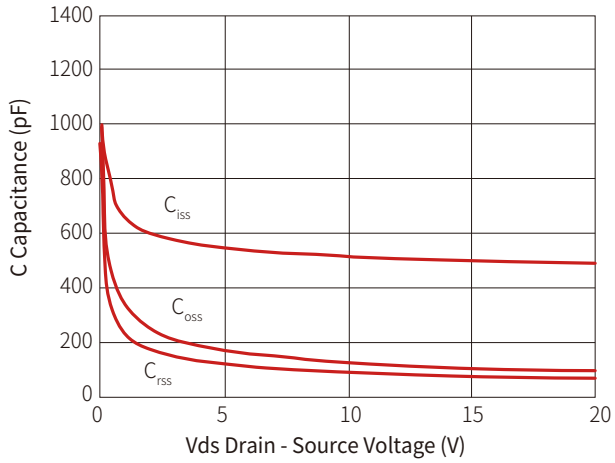


Figure 11: Gate Charge

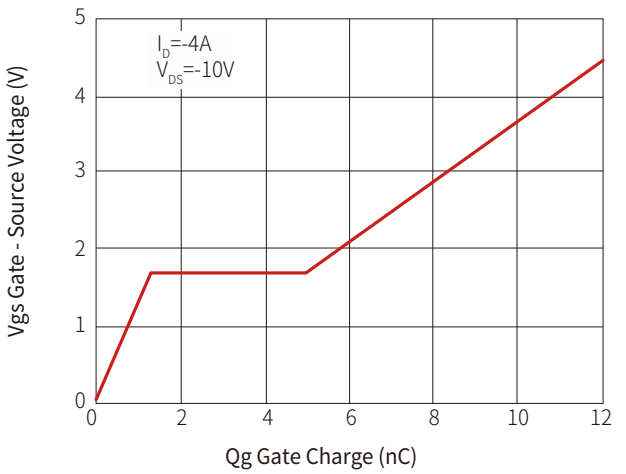


Figure 12: Source-Drain Diode Forward

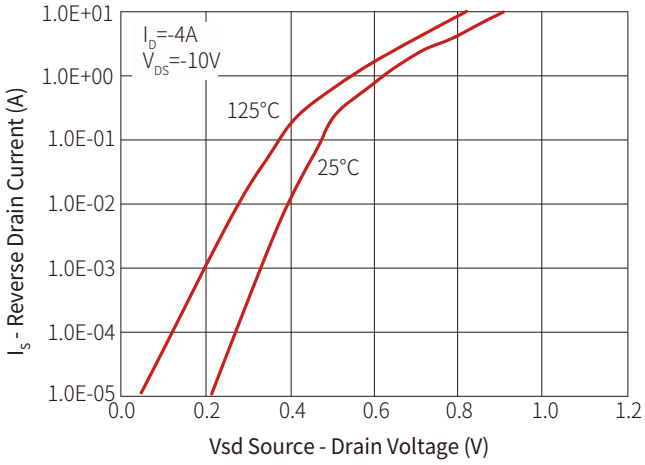
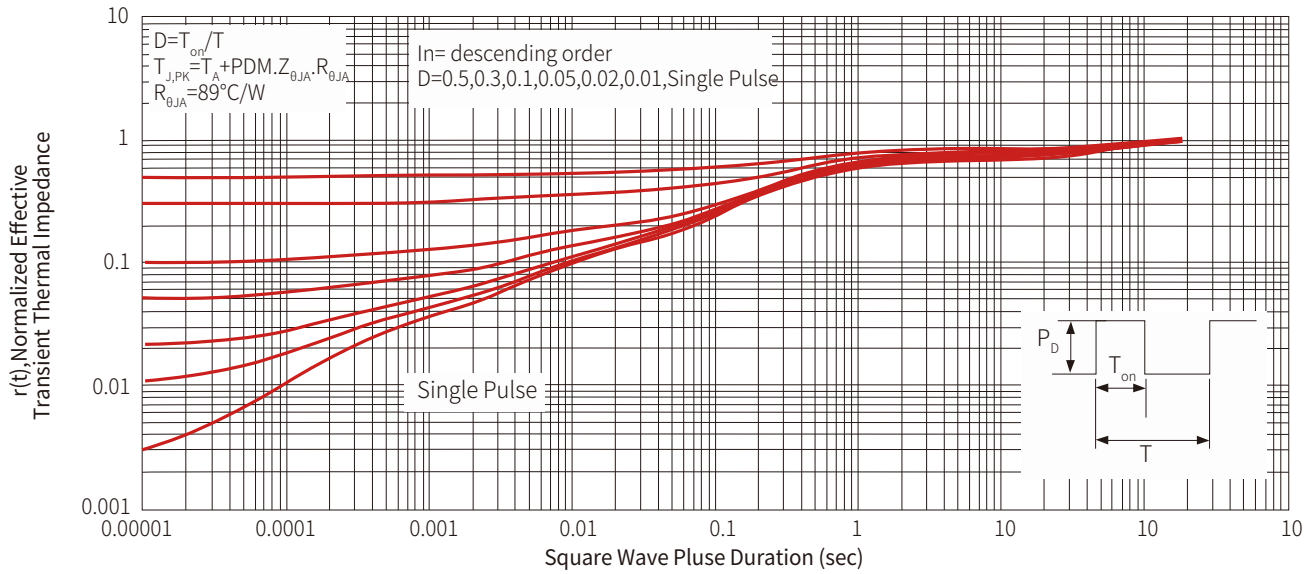
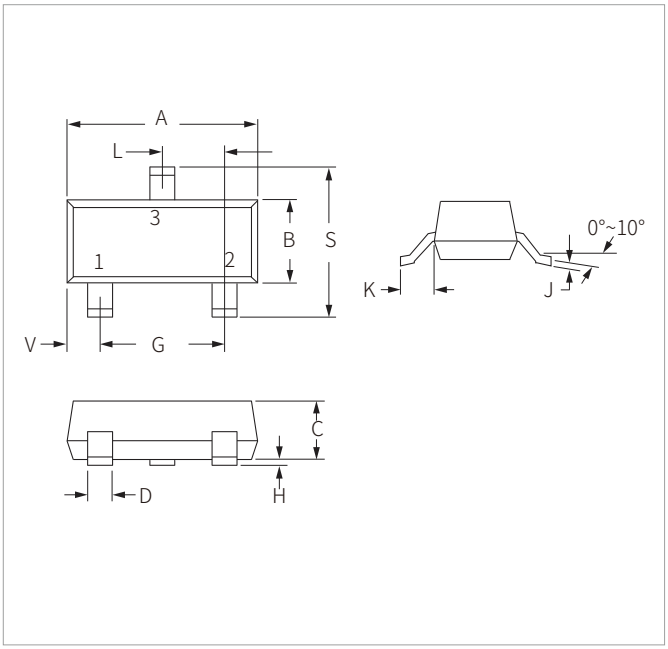


Figure 13: Normalized Maximim Transient Thermal Impedance

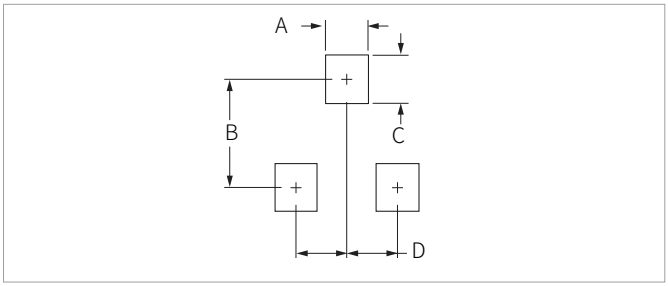


SOT-23 PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.80	3.05	0.110	0.120
B	1.20	1.40	0.047	0.055
C	0.90	1.15	0.035	0.045
D	0.37	0.50	0.015	0.020
G	1.75	2.05	0.069	0.081
H	0.01	0.100	0.001	0.004
J	0.085	0.180	0.003	0.007
K	0.35	0.69	0.014	0.029
L	0.89	1.02	0.035	0.040
S	2.10	2.65	0.083	0.104
V	0.45	0.60	0.018	0.024

RECOMMENDED PAD LAYOUT DIMENSIONS



Ref.	Millimeters		Inches	
	Min	Max	Min	Max
A	0.71	0.97	0.028	0.038
B	1.88	2.13	0.074	0.084
C	0.71	0.97	0.028	0.038
D	0.81	1.07	0.032	0.042

ORDERING INFORMATION

Part Number	Component Package	QTY/Reel	Reel Size
SPM3415S	SOT-23	3000PCS	7”

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