HUASHUO SEMICONDUCTOR

HSSK8402

N-Ch and P-Ch Fast Switching MOSFETs

Description

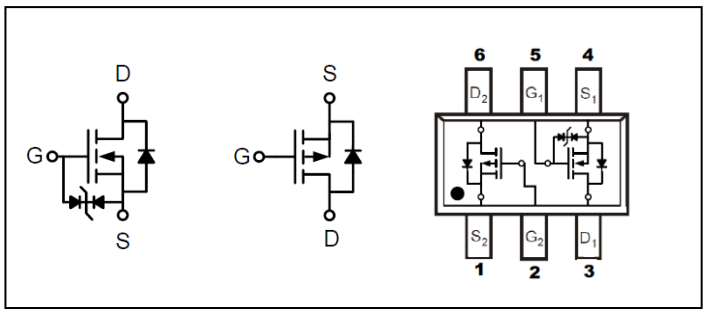
The HSSK8402 uses advanced trench technology to provide excellent RDS(ON), low gate
charge and high density cell Design for ultra low on-resistance. This device is suitable for use as a load switch or in PWM applications.

Product Summary

BVDSS	RDSON	ID
65V	1.7Ω	0.13A
-55V	1Ω	-0.13A

- PWM applications
- Load switch

SOT-363 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		N-Channel	P-Channel	
V_{DS}	Drain-Source Voltage	65	-55	V
V_{GS}	Gate-Source Voltage	±20	±20	V
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	0.13	-0.13	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 10V[1]	0.1	-0.1	A
I_{DM}	Pulsed Drain Current[2]	0.5	-0.5	A
P_D@T_A=25℃	Total Power Dissipation[4]	0.38	0.38	W
T_{STG}	Storage Temperature Range	-55 to 150	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	---	415	℃/W

N-Channel Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	65	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=0.13A	---	1.7	2.3	Ω
		V_{GS}=4.5V , I_D=0.13A	---	2.1	2.6	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.0	1.5	2.0	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-5.24	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=48V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=48V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±10	uA
gfs	Forward Transconductance	V_{DS}=30V , I_D=0.13A	---	160	---	mS
Q_g	Total Gate Charge (4.5V)	V_{DS}=30V , V_{GS}=4.5V , I_D=0.13A	---	0.6	---	nC
Q_{gs}	Gate-Source Charge		---	0.2	---	
Q_{gd}	Gate-Drain Charge		---	0.15	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=30V , V_{GS}=10V , R_G=1Ω, I_D=0.13A	---	6.5	---	ns
T_r	Rise Time		---	12	---	
$T_{d(off)}$	Turn-Off Delay Time		---	13	---	
T_f	Fall Time		---	14	---	
C_{iss}	Input Capacitance	V_{DS}=30V , V_{GS}=0V , f=1MHz	---	19	---	pF
C_{oss}	Output Capacitance		---	7.4	---	
C_{rss}	Reverse Transfer Capacitance		---	4.9	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=0.13A , T_J=25℃	---	---	1.2	V

Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The power dissipation is limited by 150℃ junction temperature
4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

P-Channel Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

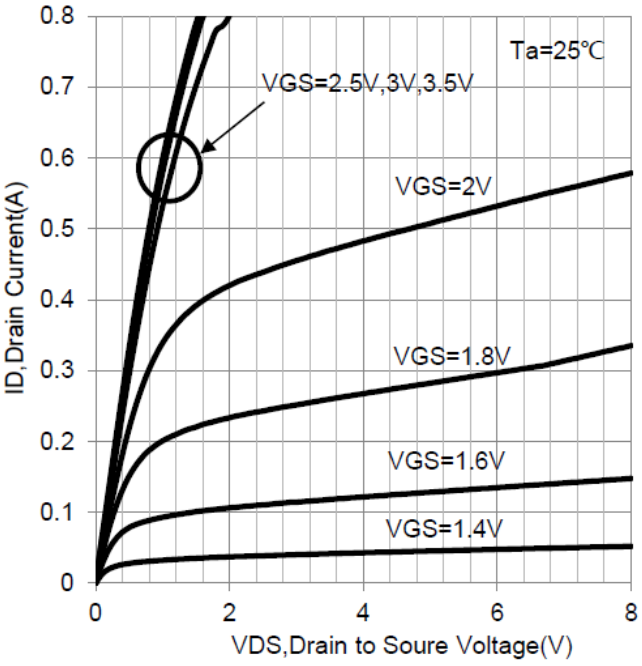
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=-250uA	-55	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=-10V , I_D=-0.13A	---	1.0	1.8	Ω
		V_{GS}=-4.5V , I_D=-0.13A	---	1.2	2.0	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =-250uA	-1.0	-1.5	-2.0	V
△$V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	4.56	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=-48V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-48V , V_{GS}=0V , T_J=55℃	---	---	-5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=-25V , I_D=-0.13A	---	60	---	S
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=-15V , V_{GEN}=-5V , R_L=50Ω, I_D=-0.13A	---	2.1	---	ns
T_r	Rise Time		---	1.1	---	
$T_{d(off)}$	Turn-Off Delay Time		---	16	---	
T_f	Fall Time		---	8	---	
C_{iss}	Input Capacitance	V_{DS}=-5V , V_{GS}=0V , f=1MHz	---	22	---	pF
C_{oss}	Output Capacitance		---	7.3	---	
C_{rss}	Reverse Transfer Capacitance		---	4	---	

Diode Characteristics

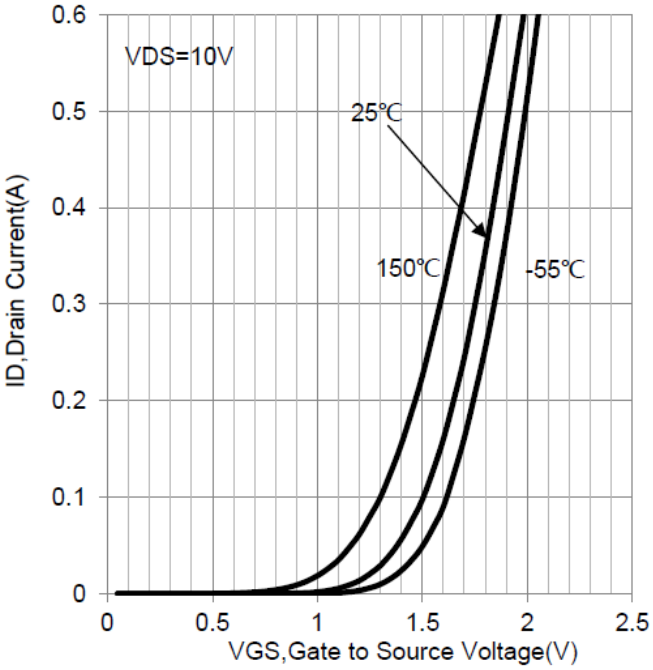
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1.2	V

Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The power dissipation is limited by 150℃ junction temperature
4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

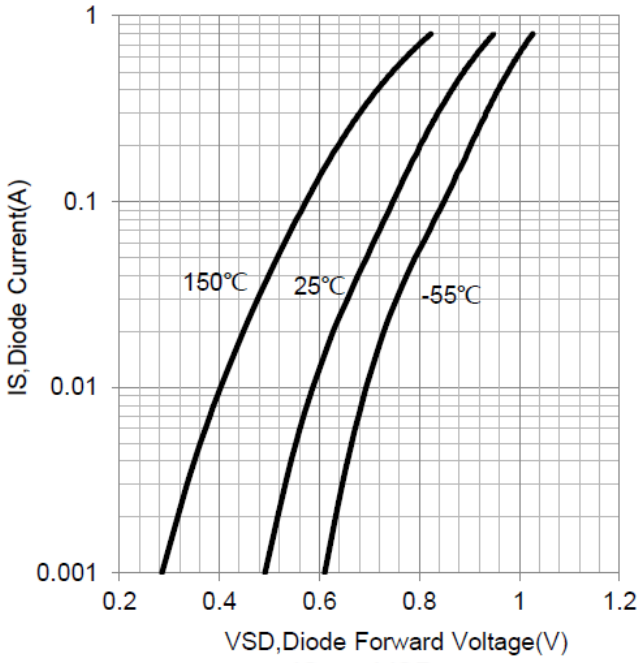
N-Channel Typical Characteristics



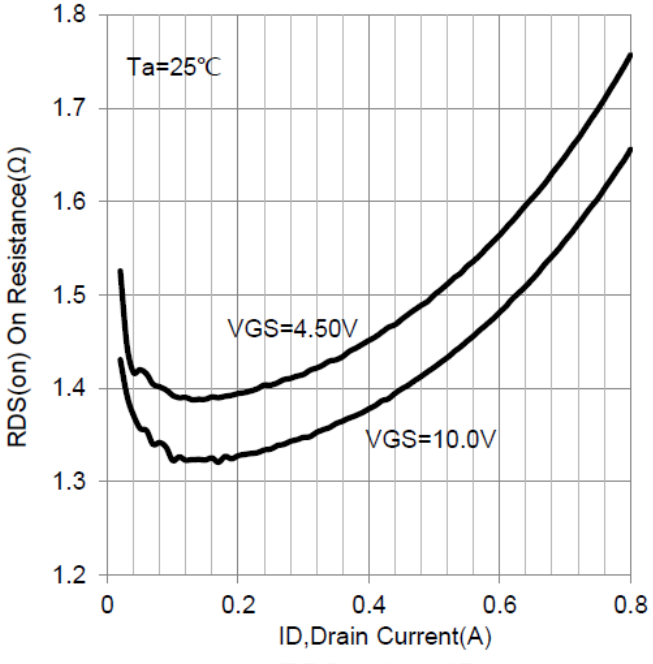
ID vs. VDS



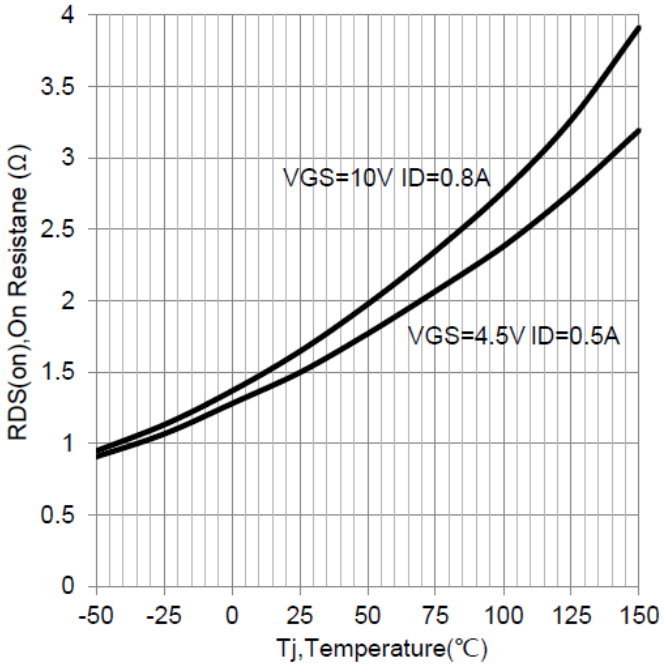
ID vs. VGS



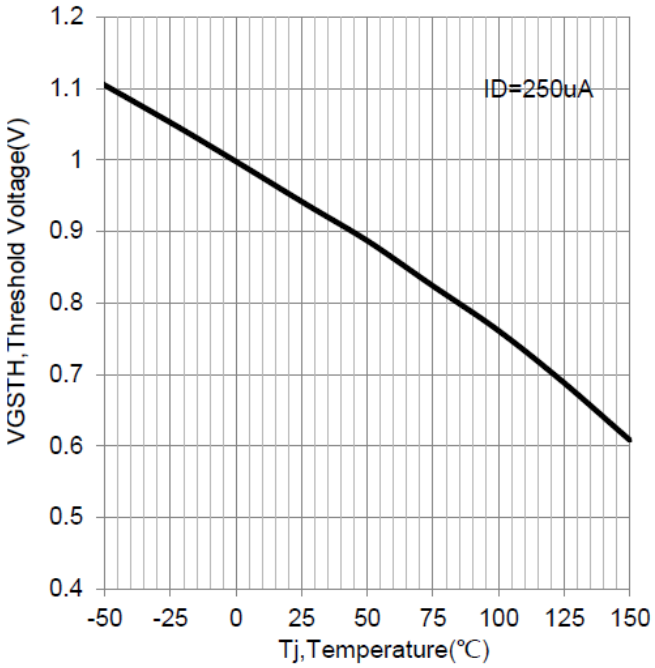
IS vs. VSD



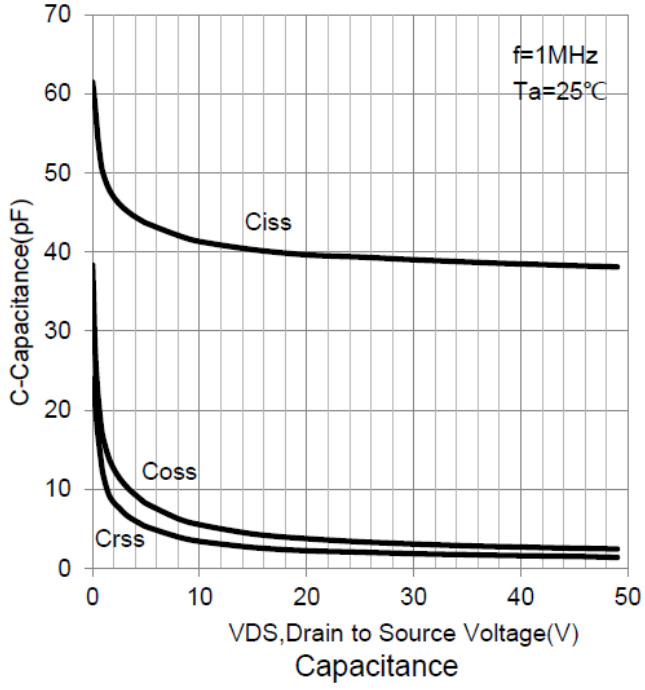
RDS(on) vs. ID



RDS(on) vs. Tj

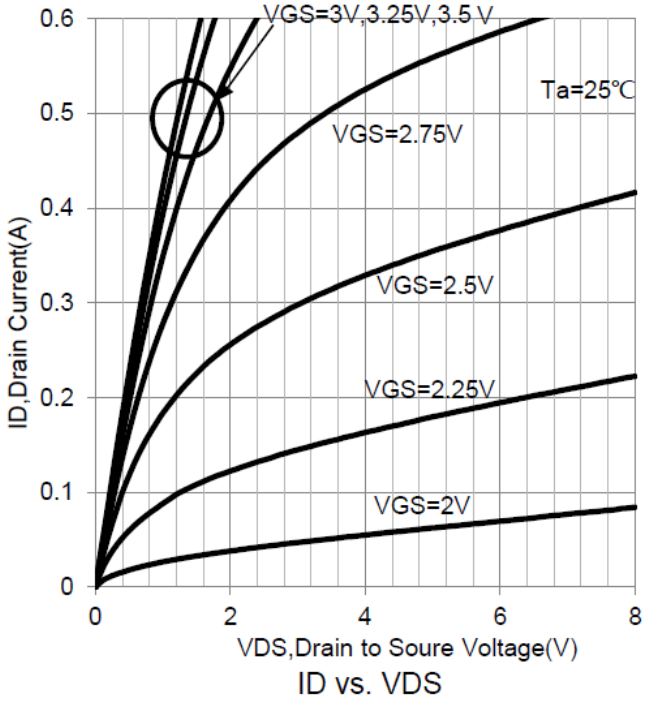


VGSTH vs. Tj

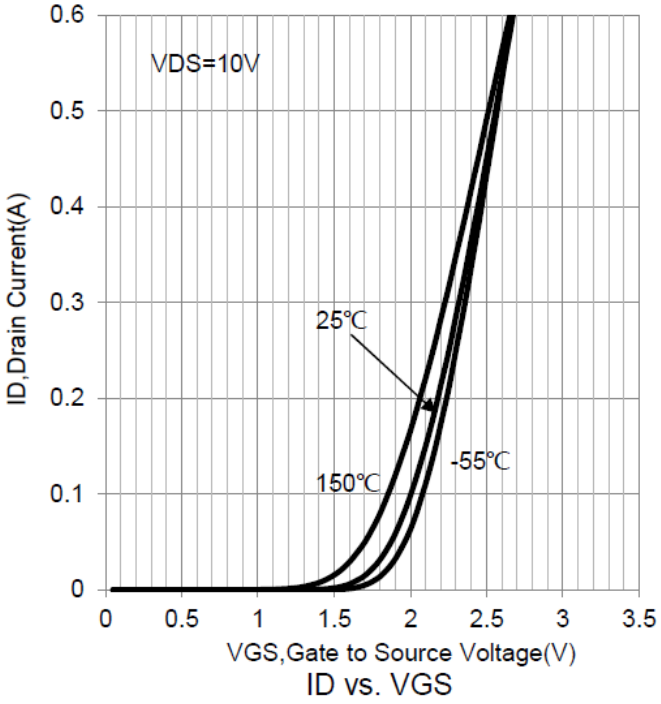


Capacitance

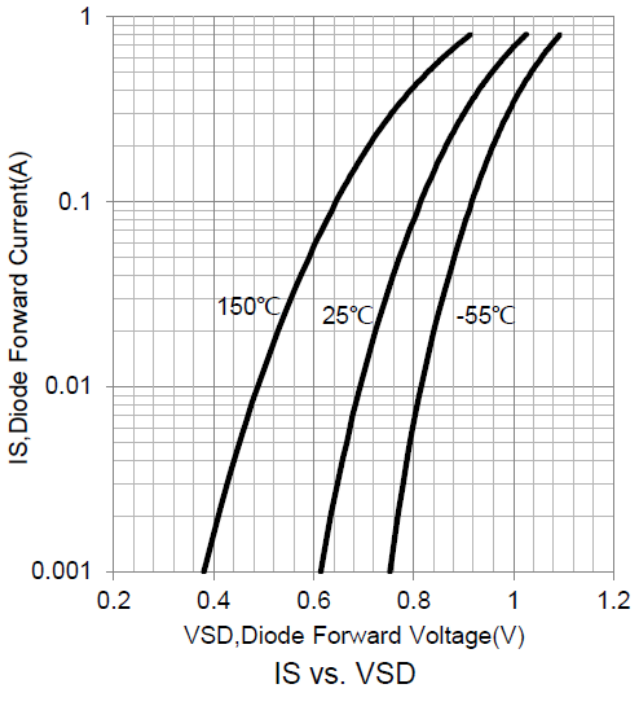
P-Channel Typical Characteristics



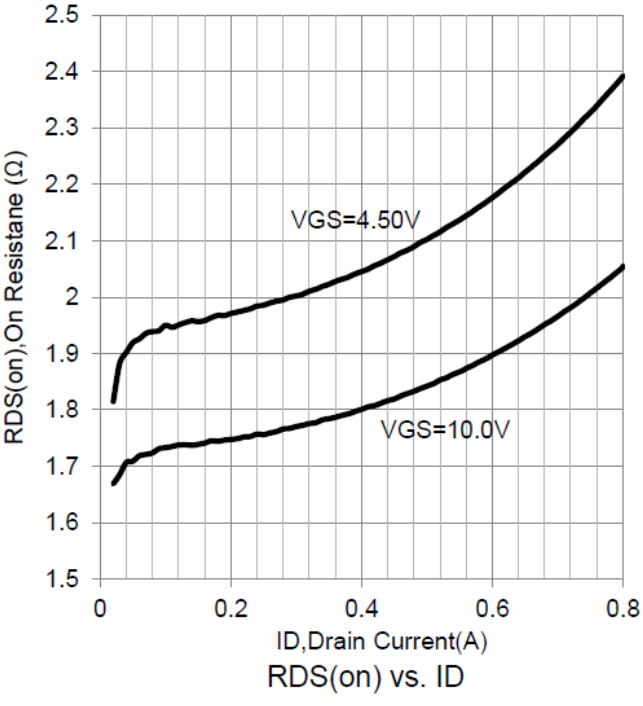
ID vs. VDS



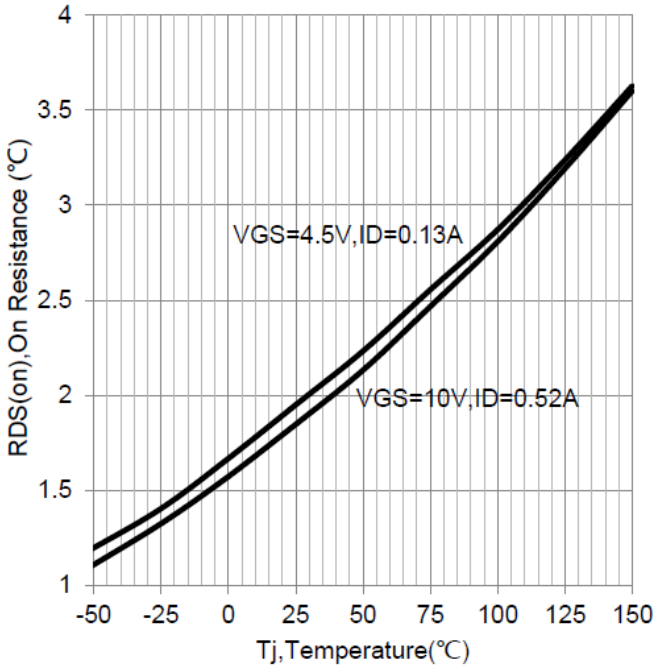
ID vs. VGS



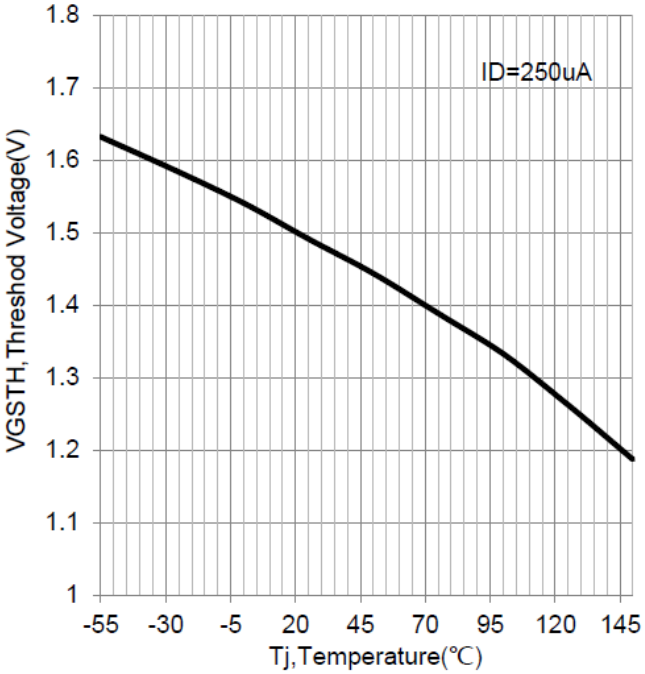
IS vs. VSD



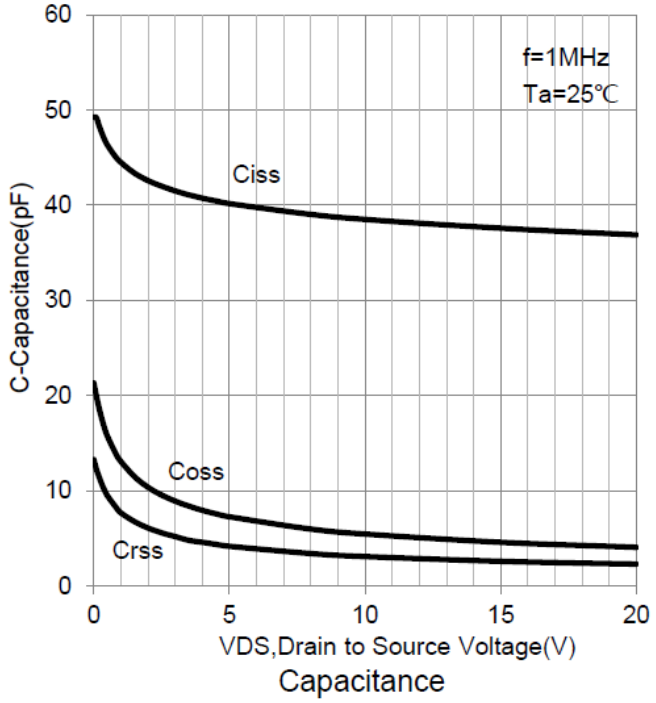
RDS(on) vs. ID



RDS(on) vs. Tj



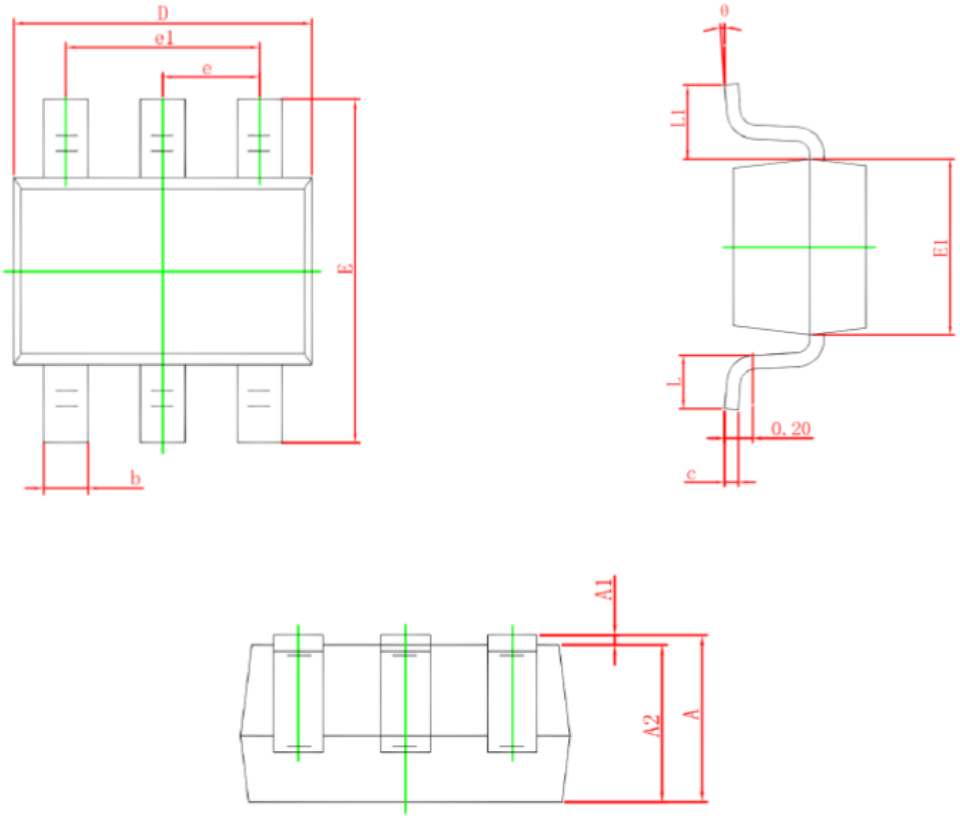
VGSTH vs. Tj



Capacitance

PACKAGE INFORMATION

- SOT-363



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	2.150	2.450	0.085	0.096
E1	1.150	1.350	0.045	0.053
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.260	0.460	0.010	0.018
L1	0.525 REF.		0.021 REF.	
θ	0°	8°	0°	8°