

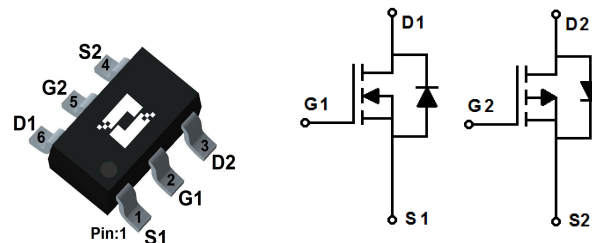
Features

- Low $R_{DS(on)}$ @ $V_{GS}=10V$
- 5V Logic Level Control
- N+P Channel SOT363 Protection
- Pb-Free, RoHS Compliant

V_{DS}	60	-60	V
$R_{DS(on),TYP} @ V_{GS}=\pm 10V$	1.4	1.7	Ω
$R_{DS(on),TYP} @ V_{GS}=\pm 4.5V$	1.6	2.0	Ω
$I_{D Max}$	0.3	-0.18	A

Applications

- High-side Load Switch
- Switching Circuits
- High Speed line Driver
- LED Lighting Application
- Networking


SOT363
Order Information

Product	Package	Marking	Packing
BSS8402DW	SOT363	KNP	3000PCS/Reel

Absolute Maximum Ratings

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Symbol	Parameter		Rating		Unit
			NMOS	PMOS	
V _{GS}	Gate-Source Voltage		±12	±12	V
V _{(BR)DSS}	Drain-Source Breakdown Voltage		60	-60	V
T _{STG} T _J	Storage and operating temperature range		-55 to 150		°C
I _S	Diode Continuous Forward Current	T _A =25°C	0.3	-0.18	A
Mounted on Large Heat Sink					
I _{DM}	Pulse Drain Current Tested①	T _A =25°C	1.5	-1.2	A
I _D	Continuous Drain Current	T _A =25°C	0.3	-0.18	A
		T _A =70°C	0.24	-0.14	
P _D	Power dissipation for Dual Operation	T _A =25°C	0.56		W
		T _A =70°C	0.4		
R _{θJA}	Thermal Resistance Junction-Ambient		220		°C/W

N-Channel Electrical Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =250μA	60	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current(T _A =25°C)	V _{DS} =60V, V _{GS} =0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T _A =125°C)	V _{DS} =48V, V _{GS} =0V	--	--	100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±12V, V _{DS} =0V	--	--	±10	μA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	2.0	3.0	V
R _{DS(ON)}	Drain-Source On-State Resistance②	V _{GS} =10V, I _D =0.15A	--	1.4	3	Ω
R _{DS(ON)}	Drain-Source On-State Resistance②	V _{GS} =4.5V, I _D =0.1A	--	1.6	4	Ω
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1MHz	--	23.8	--	pF
C _{oss}	Output Capacitance		--	3.9	--	pF
C _{rss}	Reverse Transfer Capacitance		--	1.5	--	pF
Q _g	Total Gate Charge	V _{DS} =30V I _D =0.3A, V _{GS} =10V	--	0.93	--	nC
Q _{gs}	Gate Source Charge		--	0.18	--	nC
Q _{gd}	Gate Drain Charge		--	0.31	--	nC
Switching Characteristics@ T _J = 25°C (unless otherwise stated)						
t _{d(on)}	Turn on Delay Time	V _{DD} =30V, I _D =0.1A, R _G =3.3Ω, V _{GS} =10V	--	4.4	--	ns
t _r	Turn on Rise Time		--	2.6	--	ns
t _{d(off)}	Turn Off Delay Time		-	25.5	--	ns
t _f	Turn Off Fall Time		--	3.3	--	ns
Source Drain Diode Characteristics@ T _J = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage②	I _{SD} =0.1A, V _{GS} =0V	--	0.82	1.2	V

P-Channel Electrical Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V I _D =-250μA	-60	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current(T _A =25°C)	V _{DS} =-60V, V _{GS} =0V	--	--	-1	μA
	Zero Gate Voltage Drain Current(T _A =125°C)	V _{DS} =-48V, V _{GS} =0V	--	--	-100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±12V, V _{DS} =0V	--	--	±100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-0.9	-1.5	-2.5	V
R _{DS(ON)}	Drain-Source On-State Resistance②	V _{GS} =-10V, I _D =-0.15A	--	1.7	5	Ω
R _{DS(ON)}	Drain-Source On-State Resistance②	V _{GS} =-4.5V, I _D =-0.1A	--	2.0	6	Ω
Dynamic Electrical Characteristics @ T _J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =-30V, V _{GS} =0V, f=1MHz	--	31	--	pF
C _{oss}	Output Capacitance		--	7.2	--	pF
C _{rss}	Reverse Transfer Capacitance		--	3.6	--	pF
Q _g	Total Gate Charge	V _{DS} =-30V I _D =-0.2A, V _{GS} =-10V	--	0.66	--	nC
Q _{gs}	Gate Source Charge		--	0.13	--	nC
Q _{gd}	Gate Drain Charge		--	0.12	--	nC
Switching Characteristics@ T _J = 25°C (unless otherwise stated)						
t _{d(on)}	Turn on Delay Time	V _{DD} =-30V, I _D =-0.1A, R _G =3.3Ω, V _{GS} =-10V	--	1.6	--	ns
t _r	Turn on Rise Time		--	5.2	--	ns
t _{d(off)}	Turn Off Delay Time		-	12	--	ns
t _f	Turn Off Fall Time		--	6.1	--	ns
Source Drain Diode Characteristics@ T _J = 25°C (unless otherwise stated)						
V _{SD}	Forward on voltage②	I _{SD} =-0.1A, V _{GS} =0V	--	-0.80	-1.2	V

Notes:

① Pulse width limited by maximum allowable junction temperature

②Pulse test ; Pulse width≤300μs, duty cycle≤2%.

Typical Characteristics: N Channel

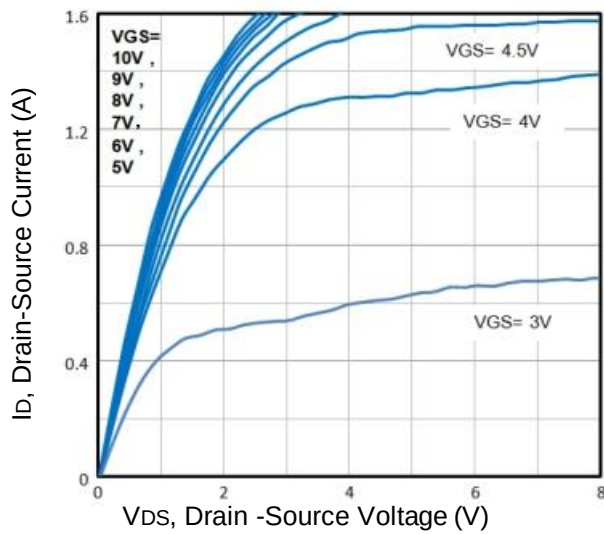


Fig1. Typical Output Characteristics

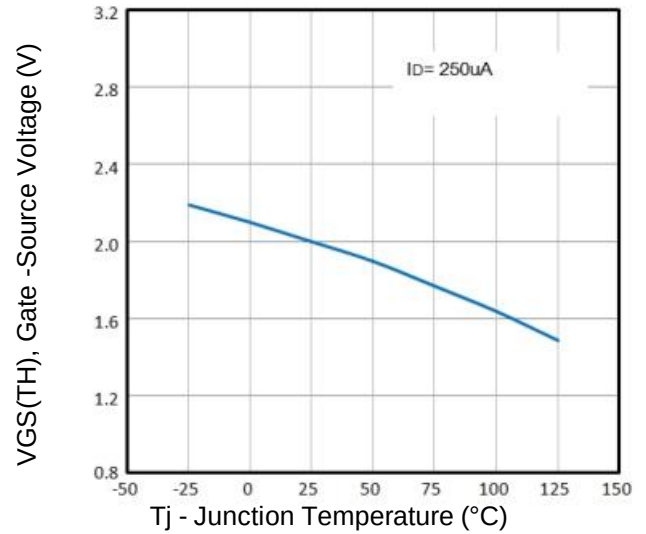


Fig2. Normalized Threshold Voltage Vs. Temperature

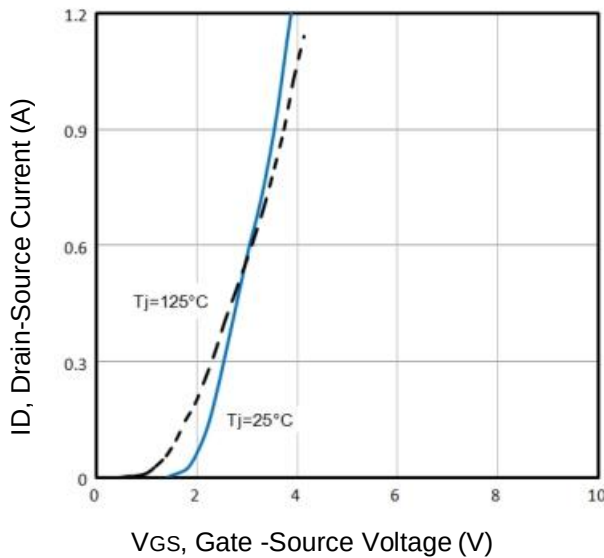


Fig3. Typical Transfer Characteristics

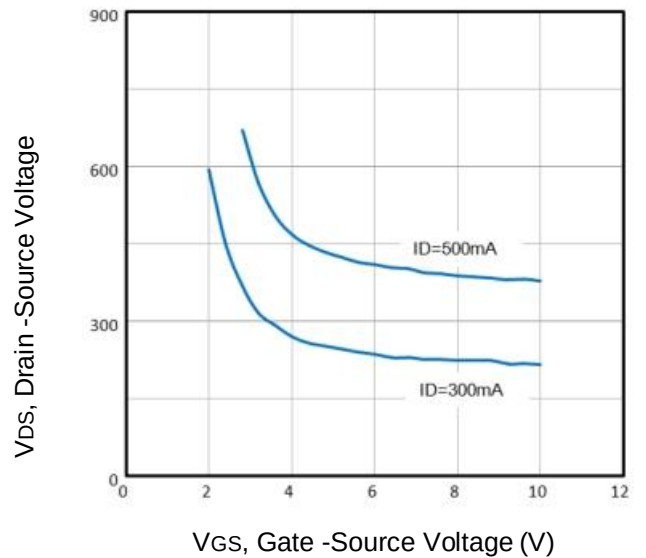


Fig4. Drain-Source Voltage vs Gate-Source Voltage

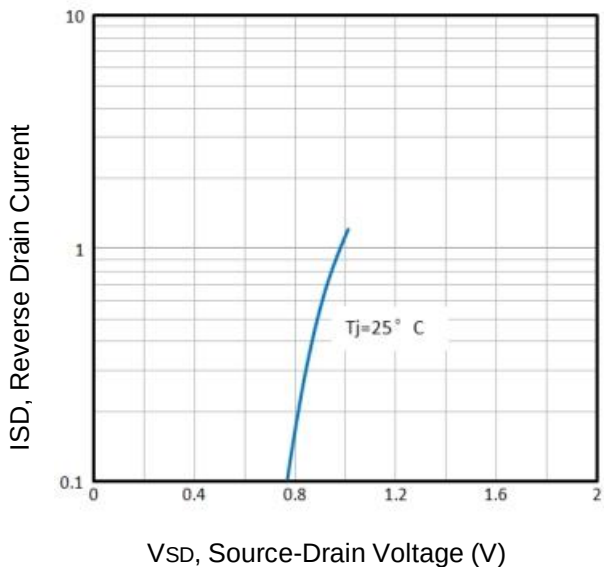


Fig5. Typical Source-Drain Diode Forward Voltage

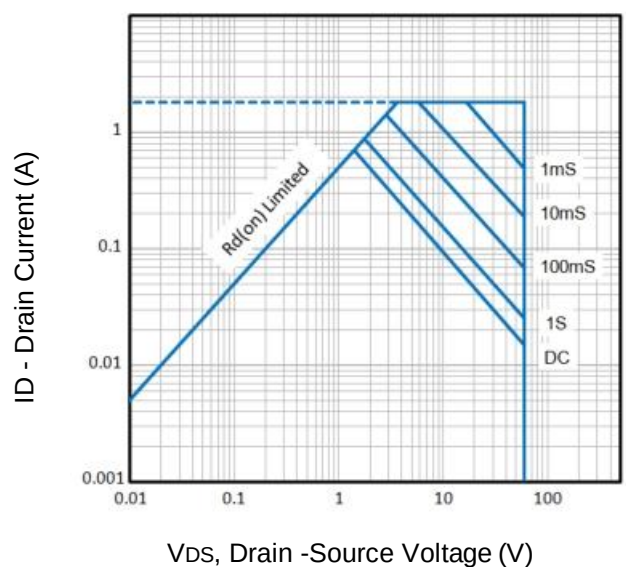


Fig6. Maximum Safe Operating Area

Typical Characteristics: N Channel

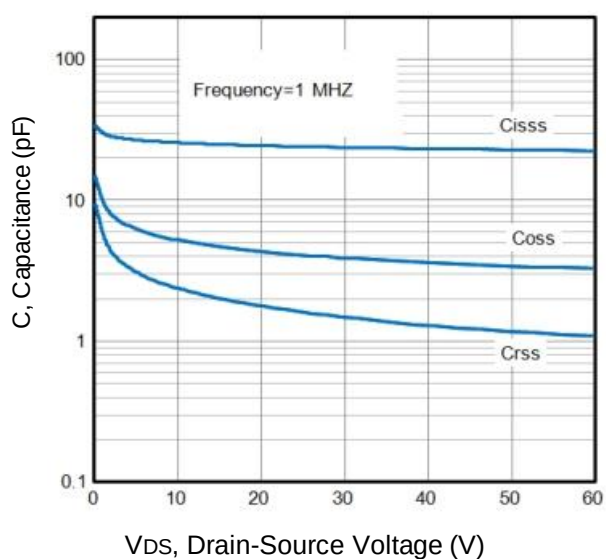


Fig7. Typical Capacitance Vs. Drain-Source

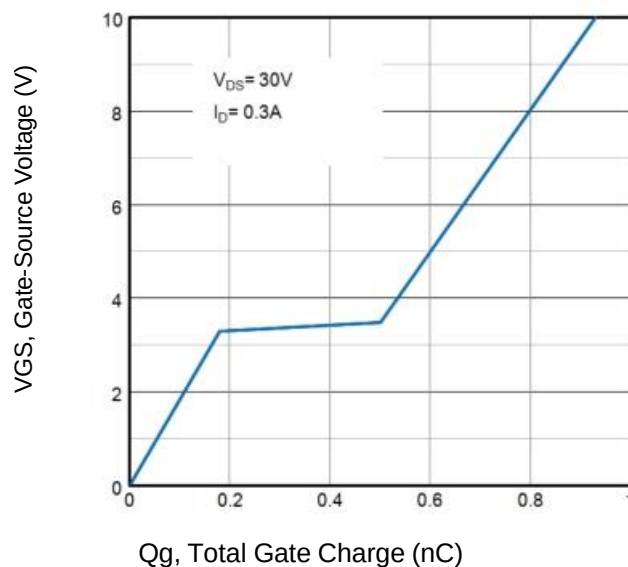


Fig8. Typical Gate Charge Vs. Gate-Source

Typical Characteristics: P-Channel

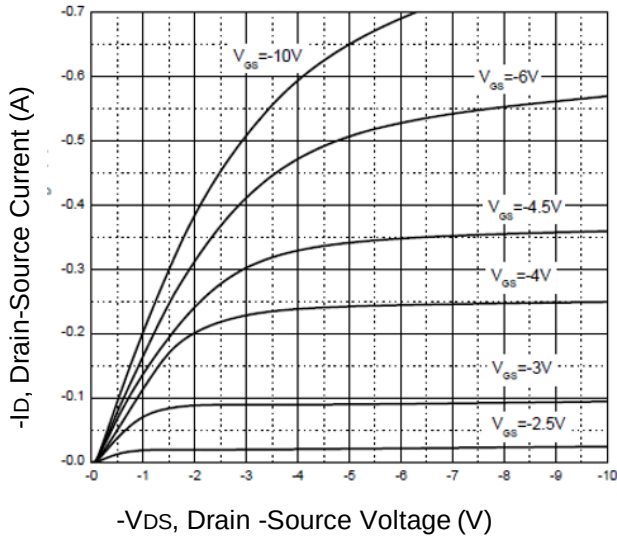


Fig9. Typical Output Characteristics

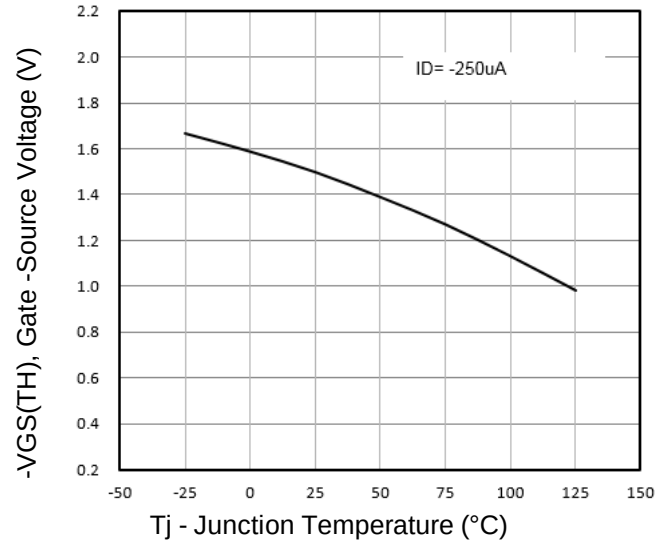


Fig10. Normalized Threshold Voltage Vs. Temperature

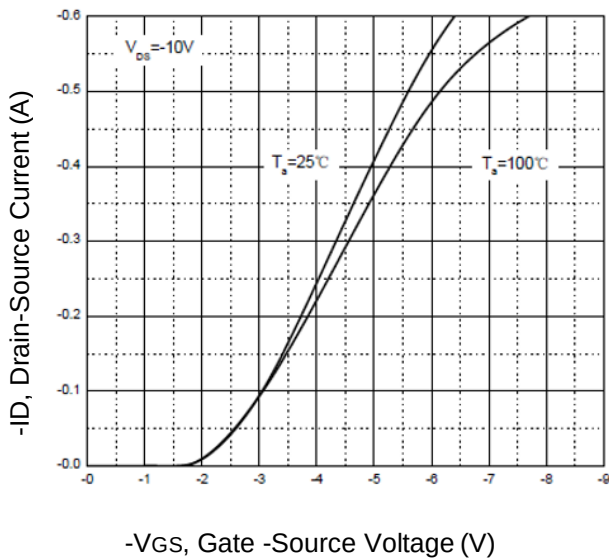


Fig11. Typical Transfer Characteristics

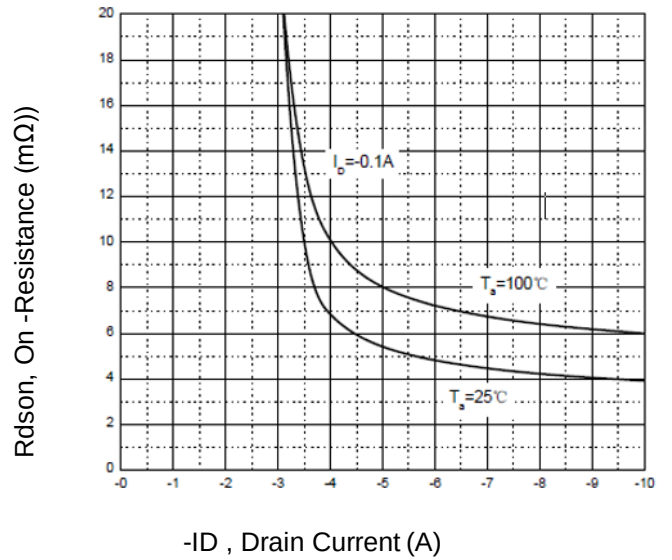


Fig12. On-Resistance vs. Drain Current and Gate

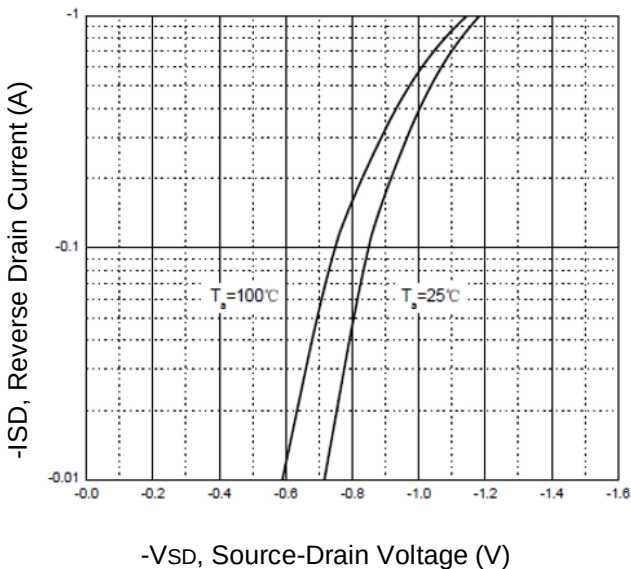


Fig13. Typical Source-Drain Diode Forward Voltage

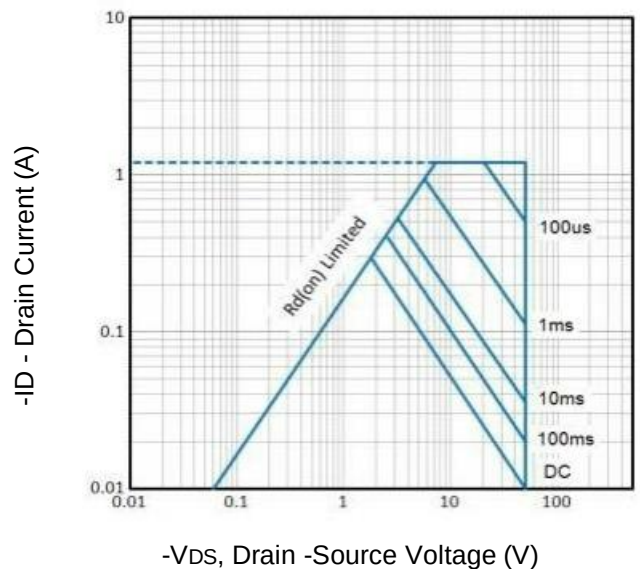


Fig14. Maximum Safe Operating Area

Typical Characteristics: P-Channel

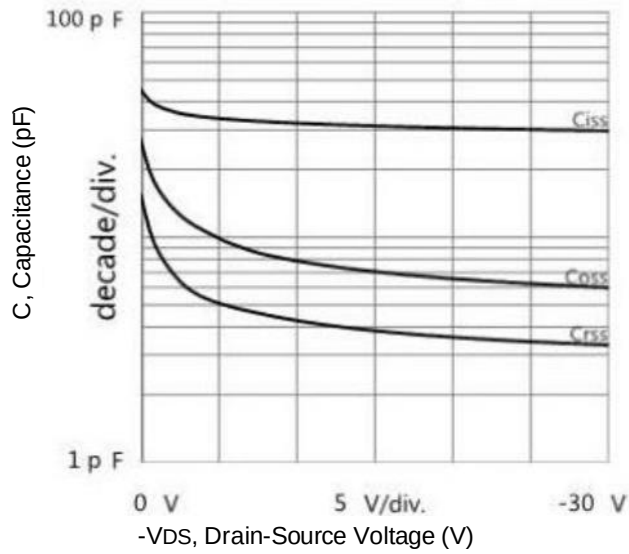


Fig15. Typical Capacitance Vs. Drain-Source Voltage

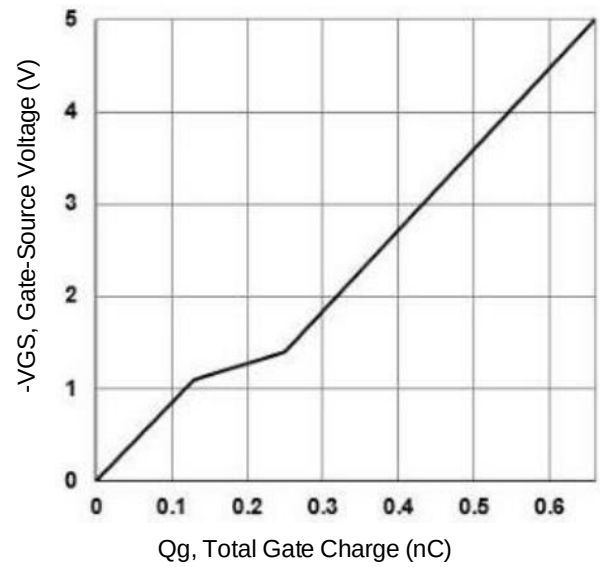
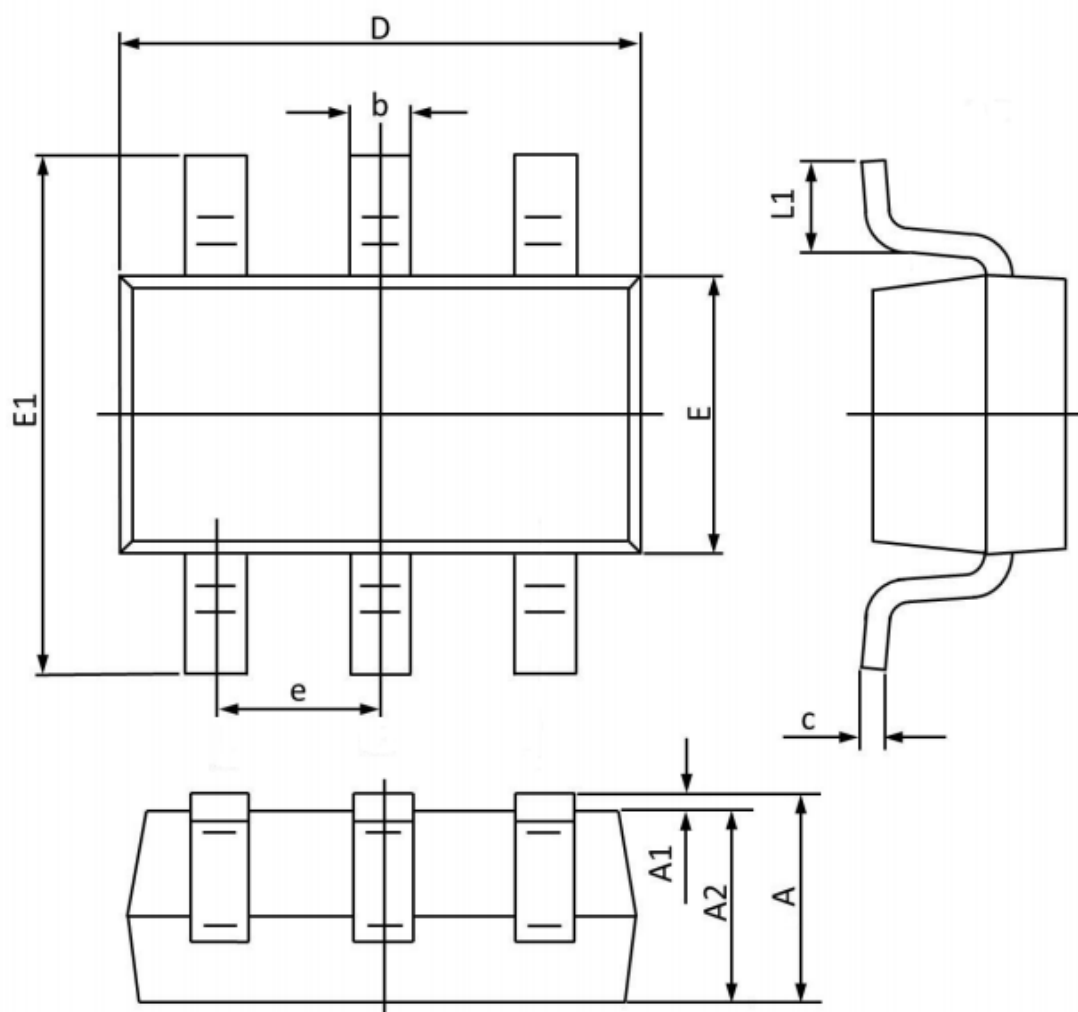


Fig16. Typical Gate Charge Vs. Gate-Source Voltage

SOT363 Mechanical Data


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.100	0.800	0.043	0.031
A1	0.100	0.000	0.004	0.000
A2	1.000	0.800	0.039	0.031
b	0.330	0.100	0.013	0.004
c	0.250	0.100	0.010	0.004
D	2.200	1.800	0.087	0.071
E	1.350	1.150	0.053	0.045
E1	2.400	1.800	0.094	0.071
e	0.65BSC		0.026BSC	
L1	0.350	0.100	0.014	0.004

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