

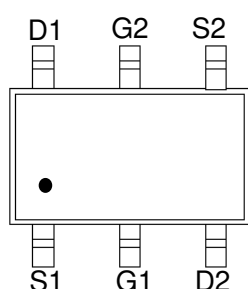
50V N-Channel and P-Channel MOSFET

Features

- High-Side Switching
- Low Threshold
- Fast Switching Speed

Application

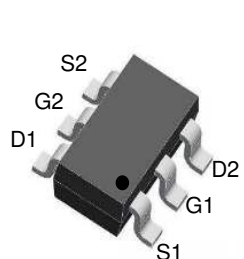
- Load/ Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift



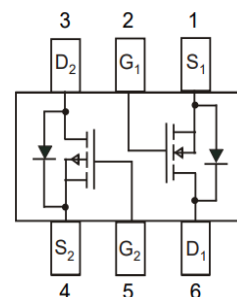
Marking and pin assignment

Product Summary

V_{DS}	$R_{DS(ON)}$ MAX	I_D MAX
50V	3Ω@10V	0.13A
	3.5Ω@5V	
-50V	5Ω@10V	-0.13A
	10Ω@5V	



SOT-363 top view



Schematic diagram



Pb-Free



RoHS



Halogen-Free

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter	N-Channel	P-Channel	Unit
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Common Ratings (TC=25°C Unless Otherwise Noted)

V_{DS}	Drain-Source Breakdown Voltage	50	-50	V
V_{GS}	Gate-Source Voltage	±20	±20	V
T_J	Maximum Junction Temperature	150	150	°C
T_{STG}	Storage Temperature Range	-55 to 150	-55 to 150	°C
I_S	Diode Continuous Forward Current	0.13	-0.13	A
	$T_C=25^{\circ}\text{C}$			

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	$T_C=25^{\circ}\text{C}$	0.52	-0.52	A
I_D	Continuous Drain Current@GS=10V	$T_C=25^{\circ}\text{C}$	0.13	-0.13	A
$R_{\theta JA}$	Thermal Resistance Junction-Ambient>(*1 in2 Pad of 2-oz Copper), Max.)		328	328	°C/W

N-Ch Electrical Characteristics (T _J =25 °C unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T _J = 25 °C (unless otherwise stated)						
B _{V(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	50	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =50V, V _{GS} =0V	--	--	1	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.5	0.8	1.5	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =0.13A	--	1.3	3	Ω
		V _{GS} =5V, I _D =0.1A	--	1.4	3.5	Ω
Dynamic Electrical Characteristics @ T _J = 25 °C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	--	42	--	pF
C _{OSS}	Output Capacitance		--	15	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	3	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DS} =30V, I _D =0.2A, V _{GS} =4.5V	--	7	--	nC
Q _{gs}	Gate Source Charge		--	1.85	--	nC
Q _{gd}	Gate Drain Charge		--	0.65	--	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =30V, I _D =0.2A, V _{GS} =4.5V, R _G =10Ω	--	4.6	--	nS
t _r	Turn-on Rise Time		--	6.8	--	nS
t _{d(off)}	Turn-Off Delay Time		--	19	--	nS
t _f	Turn-Off Fall Time		--	11.5	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	T _J =25 °C, I _S =0.1A,	--	--	1.2	V

P-Ch Electrical Characteristics (TJ=25°C unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
BV _{(BR)DSS}	Drain-Source Breakdown Voltage	VGS=0V, ID=-250μA	-50	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	VDS=-50V, VGS=0V	--	--	-1	uA
I _{GSS}	Gate-Body Leakage Current	VGS=±20V, VDS=0V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	VDS=VGS, ID=-250μA	-1	--	-2	V
R _{DS(on)}	Drain-Source On-State Resistance	VGS=-10V, ID=-0.13A	--	1.6	5	Ω
		VGS=-5V, ID=-0.1A	--	1.8	10	Ω
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	VDS=-30V, VGS=0V, f=1MHz	--	30	--	pF
C _{OSS}	Output Capacitance		--	10	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	5	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	VDD=-30V, ID=-0.15A, VGS=-4.5V	--	1.77	--	nC
Q _{gs}	Gate Source Charge		--	0.57	--	nC
Q _{gd}	Gate Drain Charge		--	0.18	--	nC
t _{d(on)}	Turn-on Delay Time	VDD=-30V, ID=-0.15A, VGS=-4.5V, RG=2.5Ω	--	2.5	--	nS
t _r	Turn-on Rise Time		--	1	--	nS
t _{d(off)}	Turn-Off Delay Time		--	16	--	nS
t _f	Turn-Off Fall Time		--	8	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	Tj=25°C, Is=-0.1A,	--	--	-1.2	V

N-Ch Typical Operating Characteristics

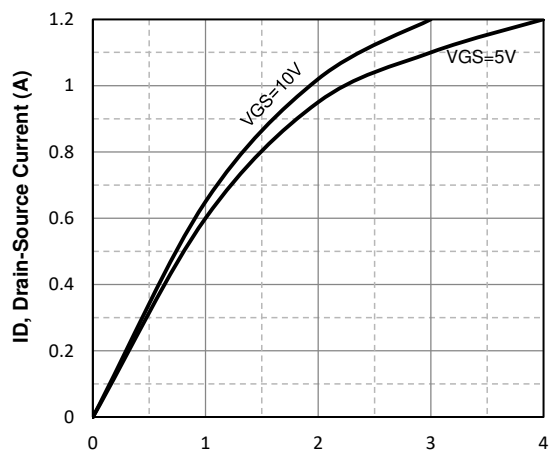


Fig1. Typical Output Characteristics

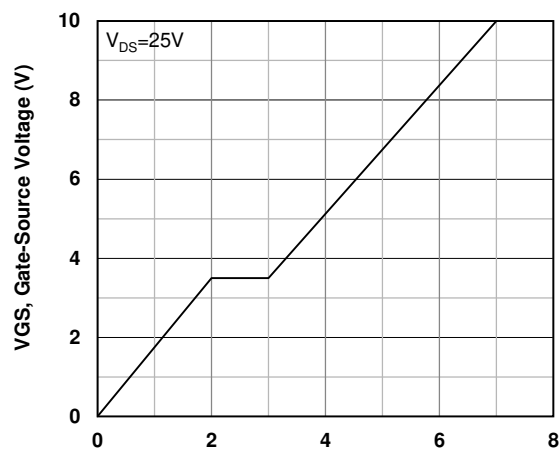


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

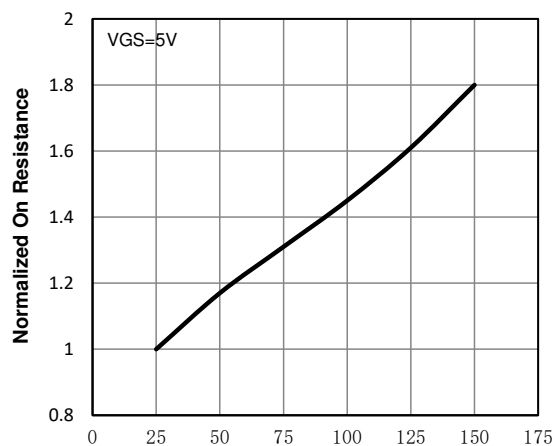


Fig3. Normalized On-Resistance Vs. Temperature

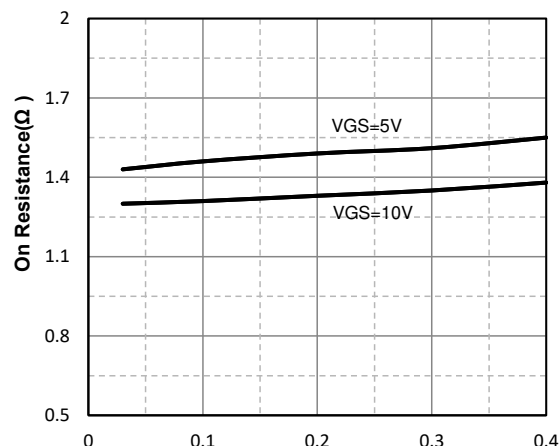


Fig4. On-Resistance Vs. Drain-Source Current

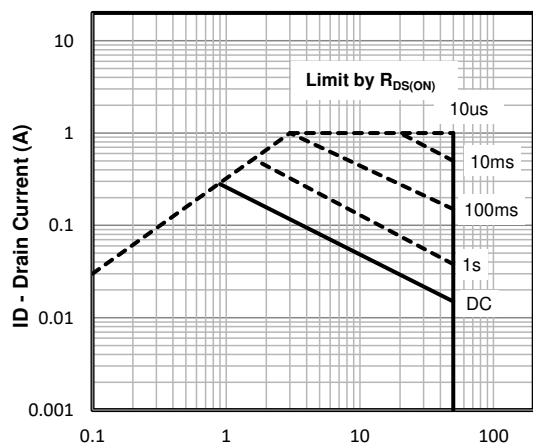


Fig5. Maximum Safe Operating Area

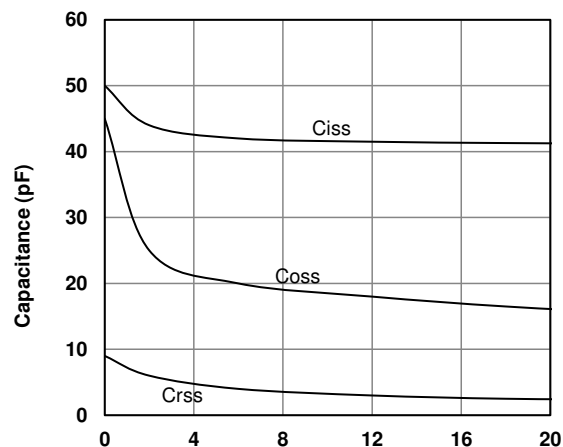
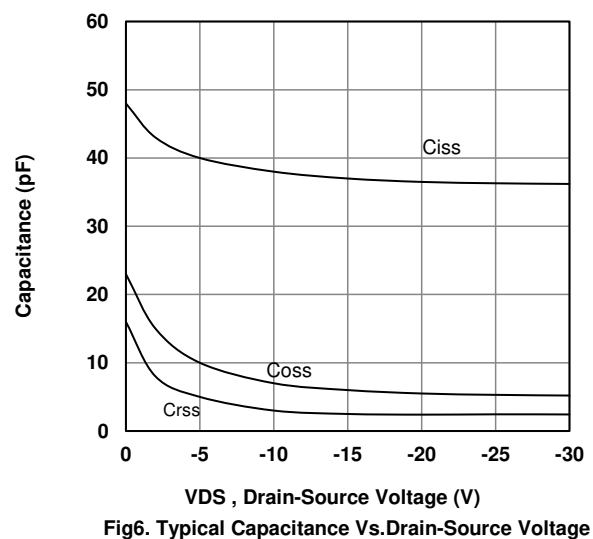
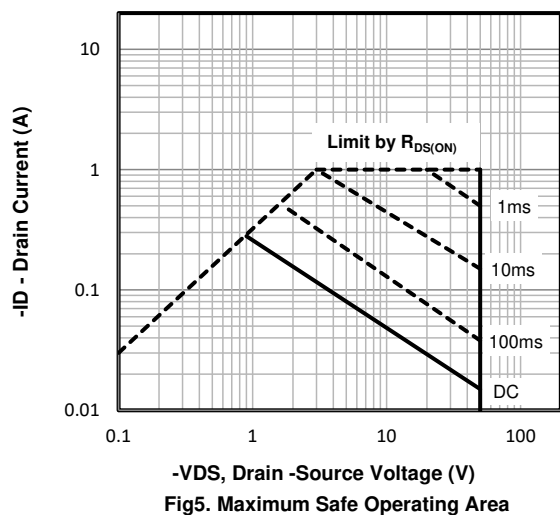
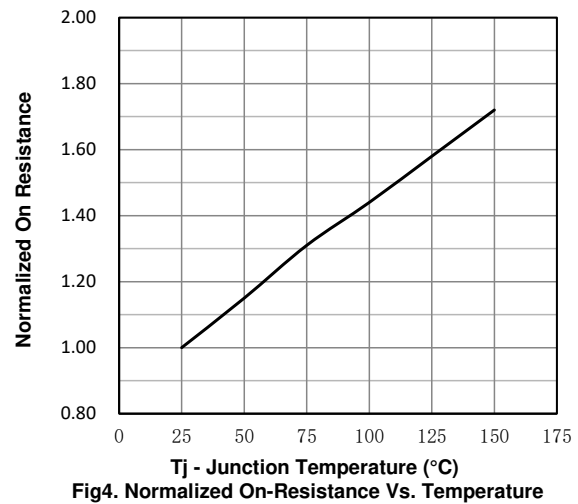
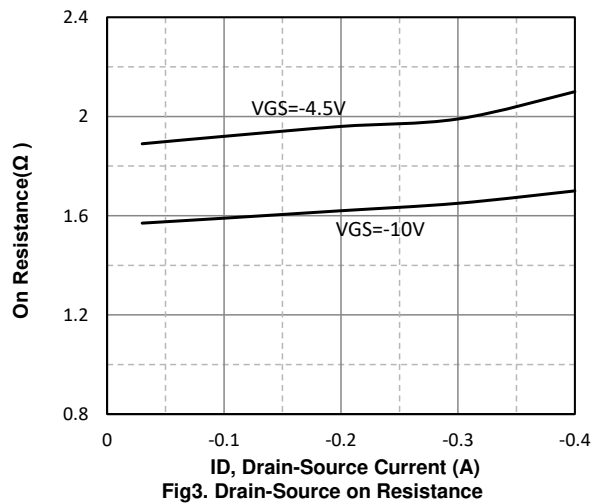
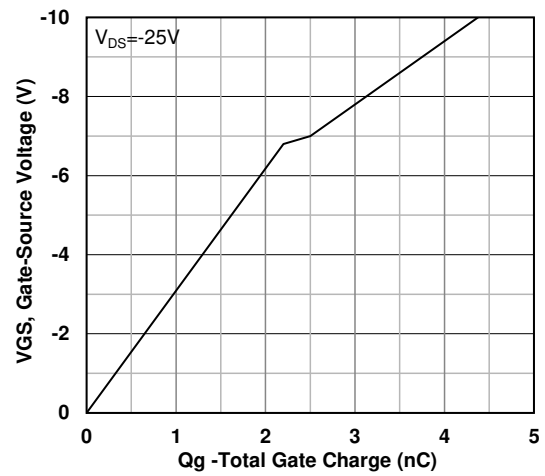
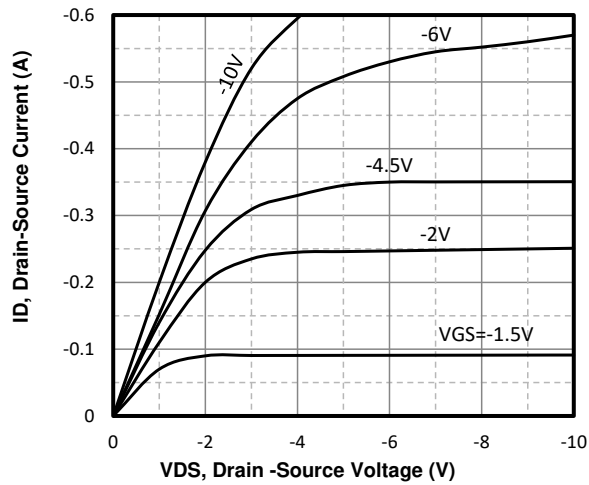
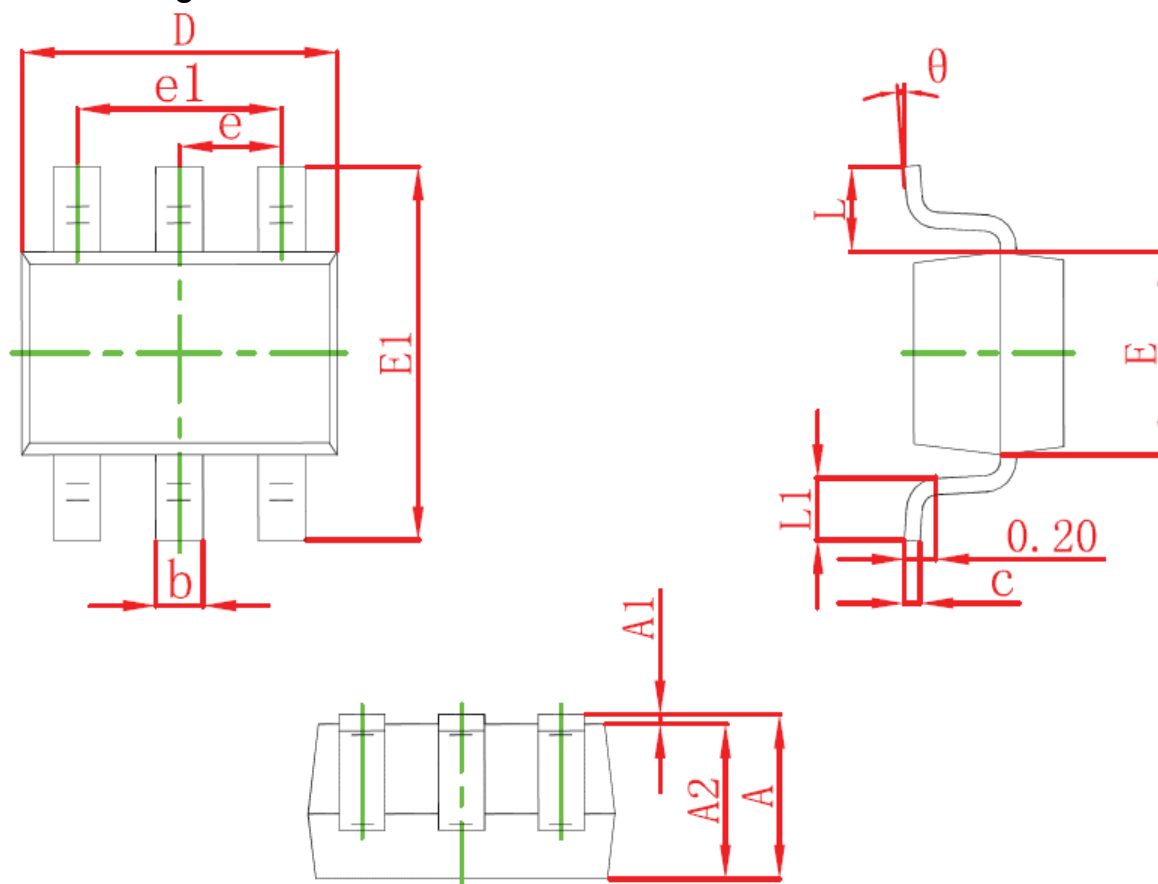


Fig6. Typical Capacitance Vs. Drain-Source Voltage

P-Ch Typical Operating Characteristics



SOT-363 Package information



Symbol	Dimensions in Millimeters(mm)		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	0.100	0.150	0.004	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.400	0.085	0.094
e	0.650TYP		0.026TYP	
e1	1.200	1.400	0.047	0.055
L	0.525REF		0.021REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°