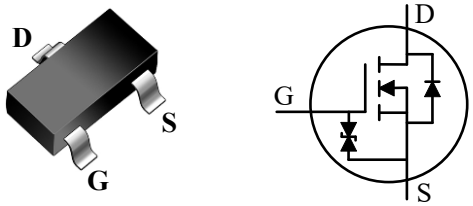
20V N-Channel Enhancement Mode MOSFET

General Features

- V_{DS} = 20V, I_D = 0.75A
- $R_{DS(on)(Typ.)}$: 182mΩ @ V_{GS} = 4.5V
- Advanced Trench Technology
- Excellent $R_{DS(on)}$ And Low Gate Charge
- Low Threshold Voltage
- ESD Rating: HBM 2.0KV
- RoHS Compliant
- Halogen-free Available

BV_{DSS}	$R_{DS(on)(Typ.)}$	I_D
20V	182mΩ	0.75A

SOT-23



Applications

- Load Switch
- PWM Application
- Notebook
- Battery Protection
- Hand-held Instruments
- Power Management
- DC/DC Conversion

Ordering Information

Part Number	Package	Marking	Remark
FTZ0P2N02G	SOT-23	0P2N02	Halogen Free

Absolute Maximum Ratings

T_A = 25°C unless otherwise specified

Symbol	Parameter	FTZ0P2N02G	Unit
V_{DSS}	Drain-to-Source Voltage [1]	20	V
V_{DGS}	Drain-to-Gate Voltage [1]	20	V
V_{GS}	Gate-to-Source Voltage	±10	V
I_D	Continuous Drain Current [2]	0.75	A
I_{DM}	Pulsed Drain Current [3]	3	A
P_D	Power Dissipation [4]	0.5	W
E_{AS}	Avalanche Energy, Single Pulse [5]	0.36	mJ
T_L	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300	°C
T_J & T_{STG}	Operating and Storage Temperature Range	-55 to 150	°C

Caution: Stresses beyond those listed in the "Absolute Maximum Ratings" may cause permanent damage to the device.

Thermal Characteristics

Symbol	Parameter	FTZ0P2N02G	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	250	°C/W

Electrical Characteristics

OFF Characteristics

T_A = 25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	20	--	--	V	V_{GS} = 0V, I_D = 250μA
I_{DSS}	Drain-to-Source Leakage Current	--	--	1	μA	V_{DS} = 20V, V_{GS} = 0V
I_{GSS}	Gate-to-Source Leakage Current	--	--	10	μA	V_{GS} = 10V, V_{DS} = 0V
		--	--	-10		V_{GS} = -10V, V_{DS} = 0V

ON Characteristics

T_A = 25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	--	182	228	mΩ	V_{GS} = 4.5V, I_D = 0.5A [6]
		--	222	278		V_{GS} = 2.5V, I_D = 0.4A [6]
$V_{GS(th)}$	Gate Threshold Voltage	0.3	0.7	1.5	V	V_{GD} = 0V, I_D = 250μA

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{iss}	Input Capacitance	--	47	--	pF	V_{GS} = 0V, V_{DS} = 10V, f = 1.0MHz
C_{oss}	Output Capacitance	--	18	--		
C_{rss}	Reverse Transfer Capacitance	--	11	--		
R_G	Gate Resistance	--	18	--	Ω	V_{GS} = 0V, V_{DS} = 0V, f = 1.0MHz
Q_g	Total Gate Charge	--	1.67	--	nC	V_{GS} = 0 to10V, V_{DD} = 10V, I_D = 0.1A
Q_{gs}	Gate-to-Source Charge	--	0.18	--		
Q_{gd}	Gate-to-Drain (Miller) Charge	--	0.22	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time	--	2.24	--	ns	V_{GS} = 10V, V_{DD} = 10V, I_D = 0.1A, R_G = 6Ω
t_r	Rise Time	--	2.16	--		
$t_{d(off)}$	Turn-off Delay Time	--	9.6	--		
t_f	Fall Time	--	10.4	--		

Source-Drain Diode Characteristics

T_A = 25℃ unless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Unit	Test Conditions
V_{SD}	Diode Forward Voltage	--	--	1.2	V	I_{SD} = 0.5A, V_{GS} = 0V

NOTE：

[1] T_J = +25℃ to +150℃.
[2] T_C = +25℃.
[3] Repetitive rating, pulse width limited by maximum junction temperature.
[4] T_C = +25℃.
[5] E_{AS} condition: Starting T_J = 25°C, V_{DD} = 10V, V_{GS} = 10V, R_G = 25Ω, L = 0.5mH, I_{AS} = 1.2A.
[6] Pulse width ≤ 380μs, duty cycle ≤ 2%.

Typical Characteristics

Figure 1. Maximum Power Dissipation vs. Case Temperature

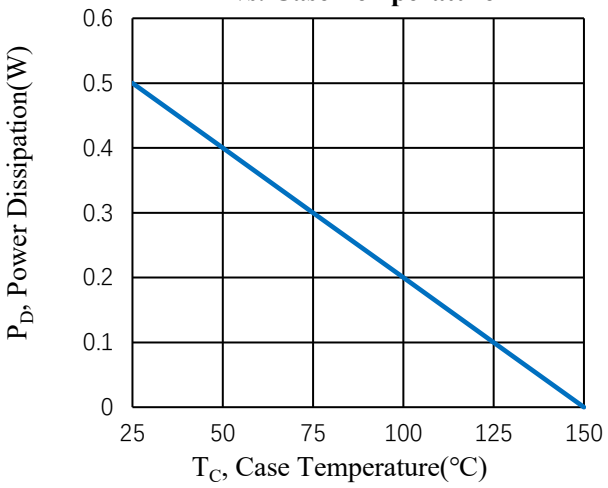


Figure 2. Maximum Continuous Drain Current vs. Case Temperature

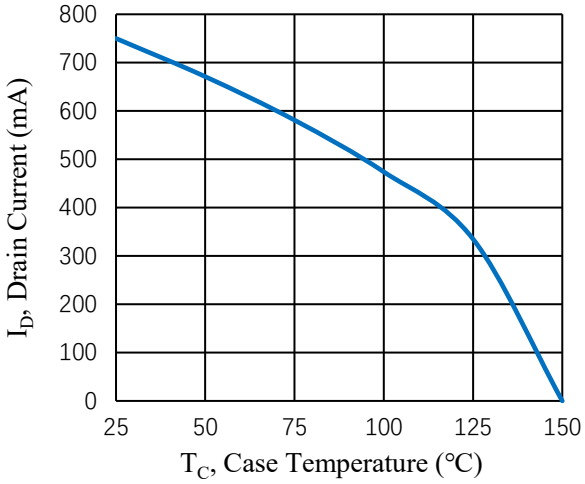


Figure 3. Typical Output Characteristics

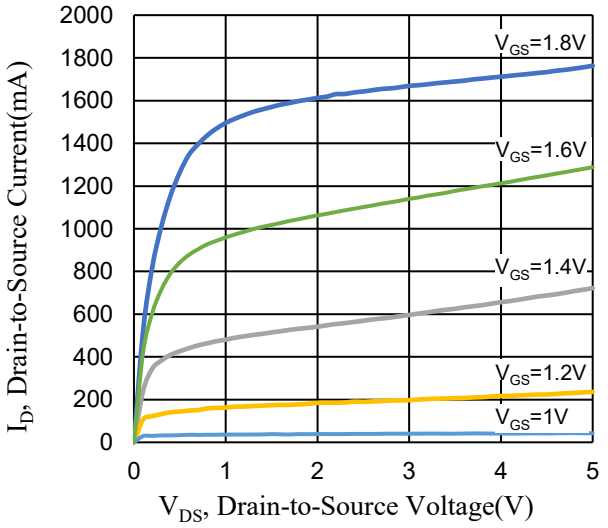


Figure 4. Typical Transfer Characteristics

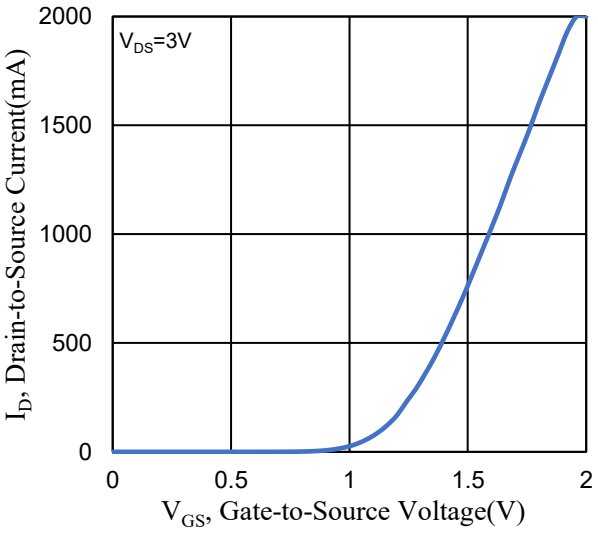


Figure 5. Typical Capacitance vs. Drain-to-Source Voltage

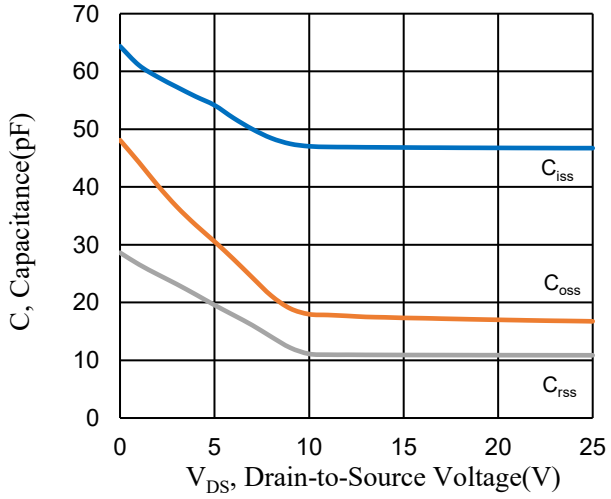
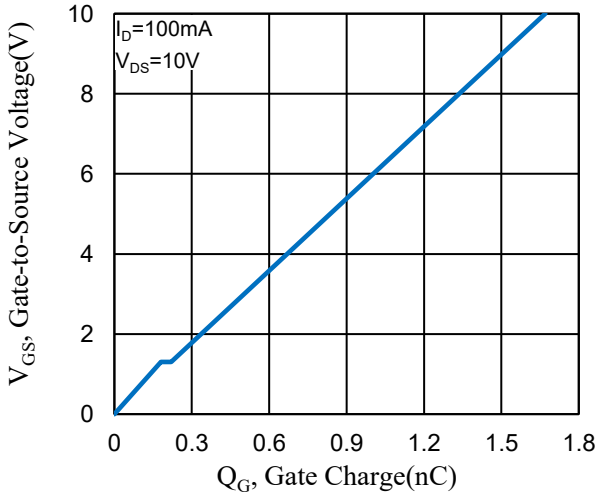
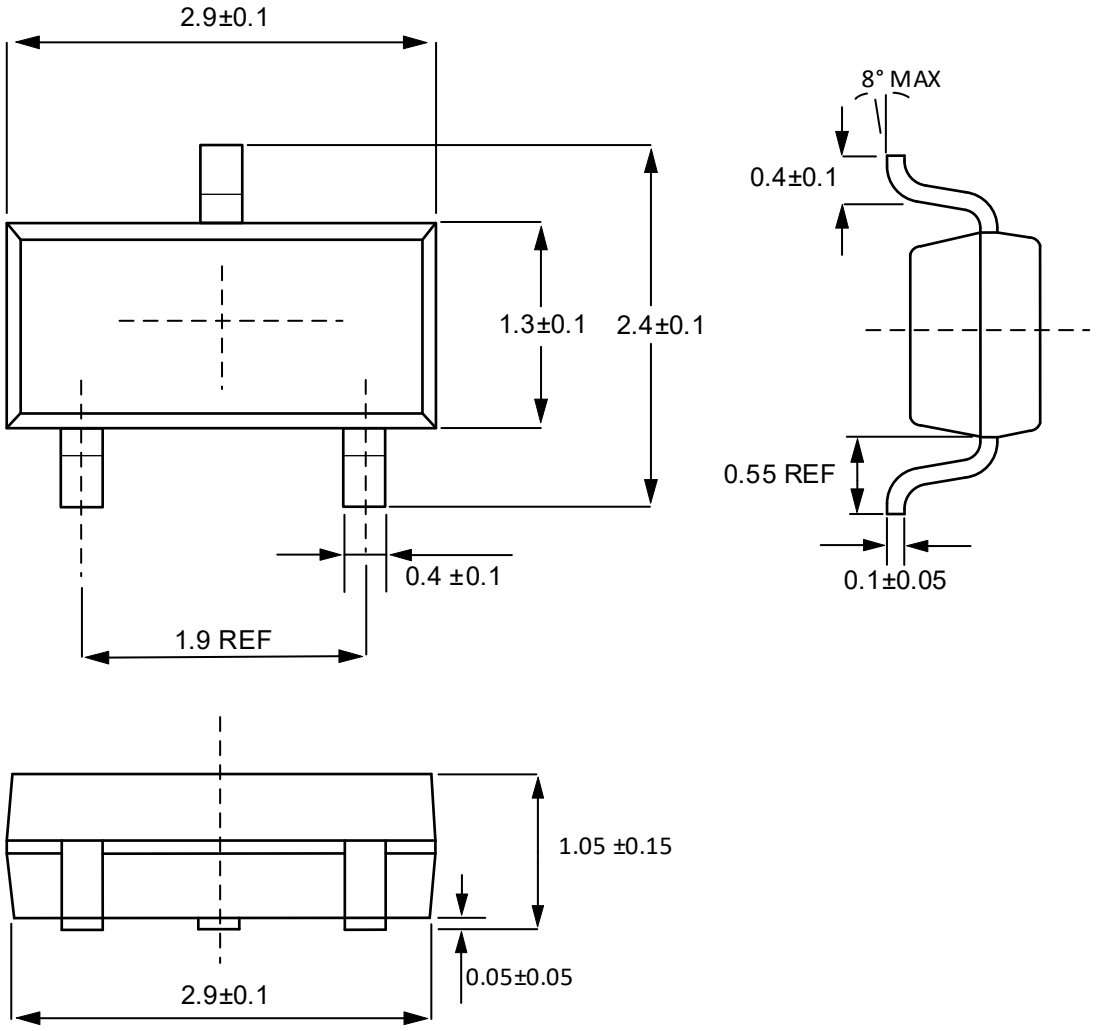


Figure 6. Typical Gate Charge vs. Gate-to-Source Voltage



Package Dimensions

SOT-23



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