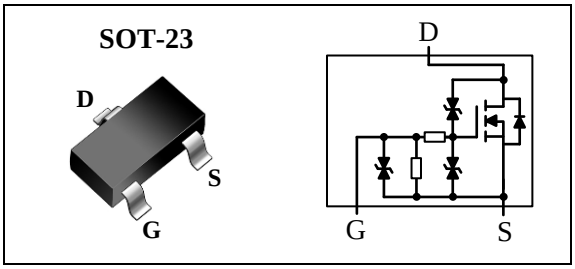
60V N-Channel Enhancement Mode MOSFET

General Features

- 60V Voltage Capability
- Low On-Resistance: $R_{DS(on)}$=3Ω(Max.)@V_{GS}=3V
- Build-in Active Clamp Structure (Zener Diode + Resistor) for Inductive Load Driving
- SOT-23 Packages
- Fast Switching Characteristics
- RoHS Compliant
- Halogen-free Available

BV_{DSS}	$R_{DS(on)(Max.)}$	I_D
60V	3Ω	0.35A



Applications

- Relay Drivers
- Solenoid Drivers
- General-Purpose Switching
- DC-DC Converters
- Power Management in Automotive and Industrial Systems

Ordering Information

Part Number	Package	Marking	Remark
FTZ03N06G	SOT-23	03N06	Halogen Free

Absolute Maximum Ratings

T_A = 25℃ unless otherwise specified

Symbol	Parameter	FTZ03N06G	Unit
V_{DSS}	Drain-to-Source Voltage [1]	60	V
V_{DGS}	Drain-to-Gate Voltage [1]	60	V
V_{GS}	Gate-to-Source Voltage	±12	V
I_D	Continuous Drain Current [2]	0.35	A
I_{DM}	Pulsed Drain Current [3]	1.4	A
P_D	Power Dissipation [4]	0.5	W
T_L	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300	℃
T_J & T_{STG}	Operating and Storage Temperature Range	-55 to 150	℃

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

Thermal Characteristics

Symbol	Parameter	FTZ03N06G	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	250	℃/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	60	--	--	V	V_{GS} = 0V, I_D = 10mA
I_{DSS}	Drain-to-Source Leakage Current	--	--	1	μA	V_{DS} = 60V, V_{GS} = 0V
I_{GSS}	Gate-to-source Leakage Current	--	--	±60	μA	V_{GS} = ±3V, V_{DS} = 0V
		--	--	±90		V_{GS} = ±5V, 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	--	--	3.0	Ω	V_{GS} = 3V, I_D = 0.15A [5]
		--	--	2.5		V_{GS} = 5V, I_D = 0.15A [5]
$V_{GS(th)}$	Gate Threshold Voltage	1.3	--	2.0	V	V_{GS} = V_{DS}, I_D = 1mA

Dynamic Characteristics

T_A = 25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{iss}	Input Capacitance	--	52	--	pF	V_{GS} = 0V, V_{DS} = 12V, f = 1.0MHz
C_{oss}	Output Capacitance	--	27	--		
C_{rss}	Reverse Transfer Capacitance	--	4.1	--		
Q_g	Total Gate Charge	--	1.6	--	nC	V_{GS} = 5V, V_{DD} = 12V, I_D = 0.3A
Q_{gs}	Gate-to-Source Charge	--	0.3	--		
Q_{gd}	Gate-to-Drain (Miller) Charge	--	1.0	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{(on)}$	Turn-on Time	--	1040	--	ns	V_{GS} = 0V to 3V, V_{DD} = 12V, I_D = 0.3A, R_G = 50Ω
$t_{(off)}$	Turn-off Time	--	880	--		

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} = 0.3A, 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] Pulse width ≤ 380μs, duty cycle ≤ 2%.

Switching Time Test Circuit

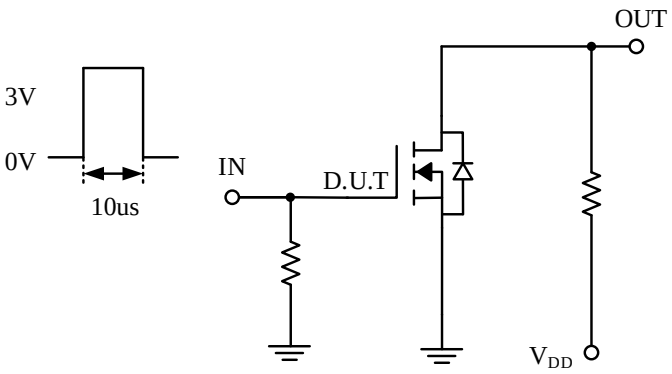


Fig 1. Switching Time Test Circuit

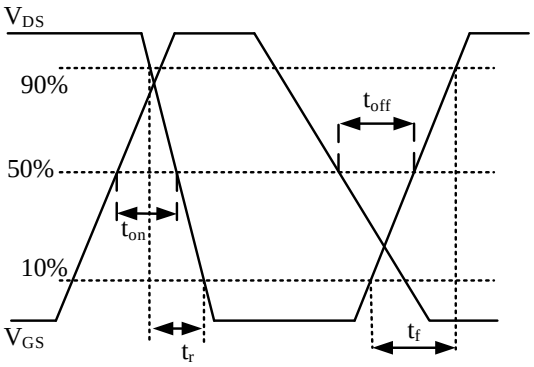


Fig 2. Input Waveform/Output Waveform

Application Information

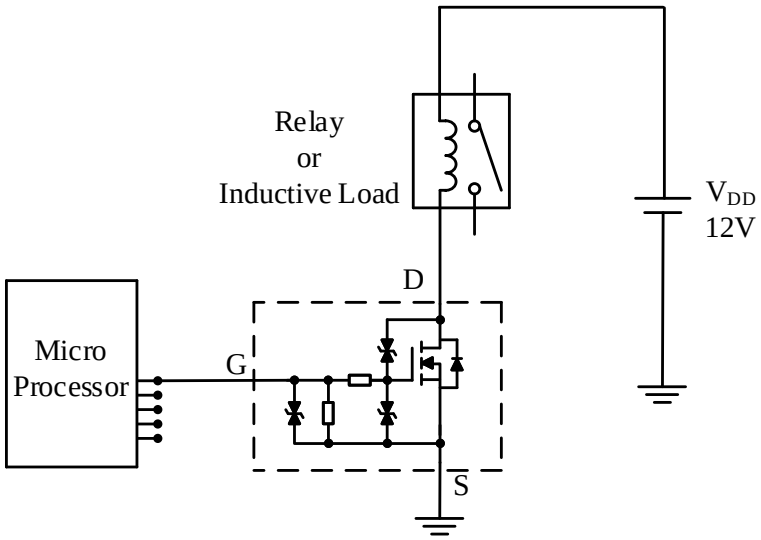


Fig 3. Application Circuit

Typical Characteristics

Figure 4. Maximum Power Dissipation vs. Case Temperature

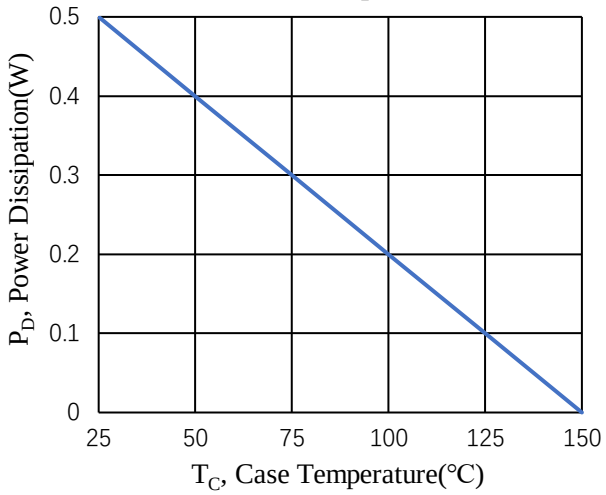


Figure 5. Maximum Continuous Drain Current vs. Case Temperature

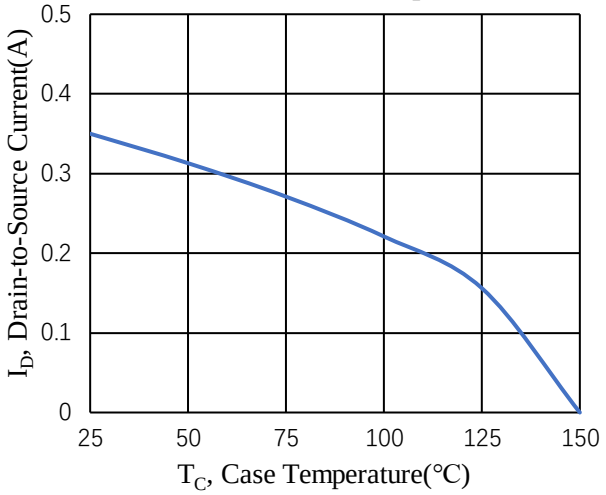


Figure 6. Typical Output Characteristics

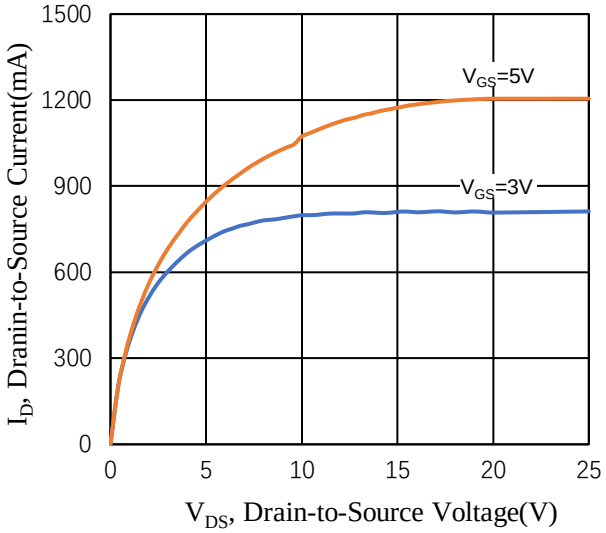


Figure 7. Typical Transfer Characteristics

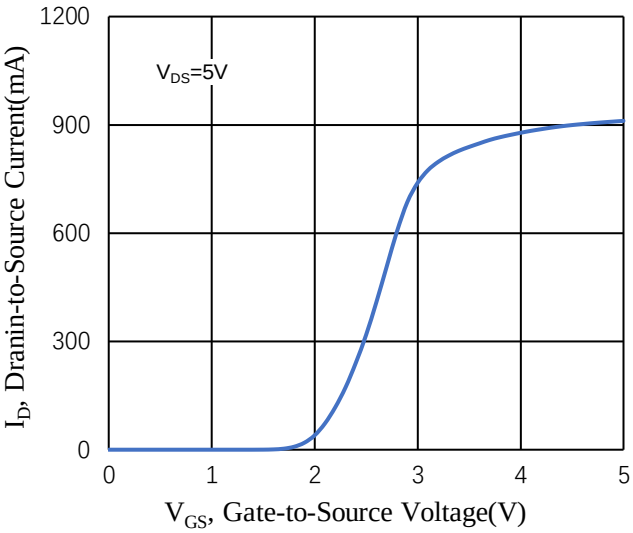


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

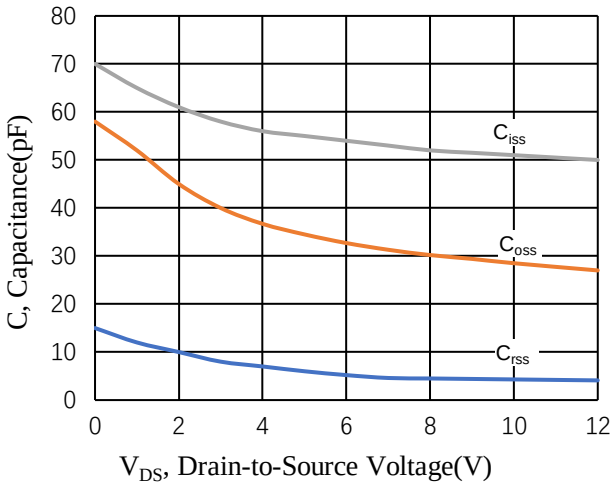


Figure 9. Typical Gate Charge vs. Gate-to-Source Voltage

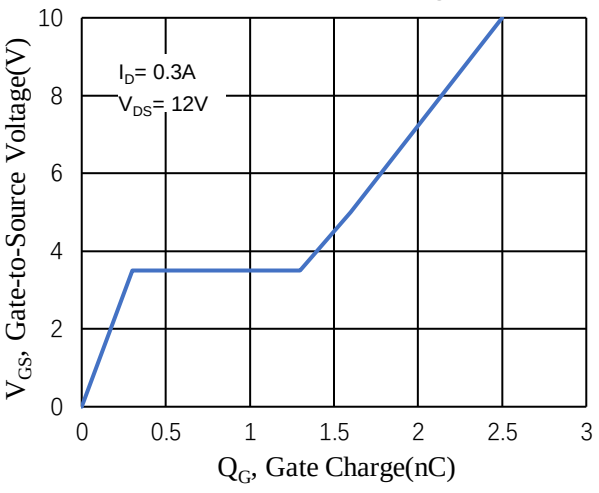


Figure 10. Threshold Voltage vs. Temperature

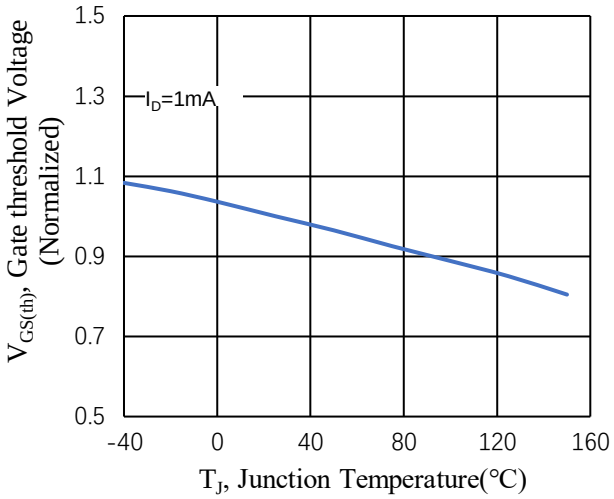


Figure 11. Normalized On-Resistance vs. Junction Temperature

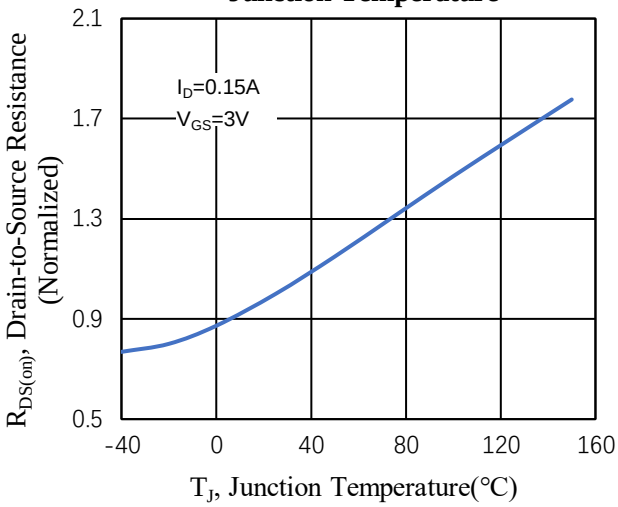


Figure 12. Drain-to-Source Breakdown Voltage vs. Junction Temperature

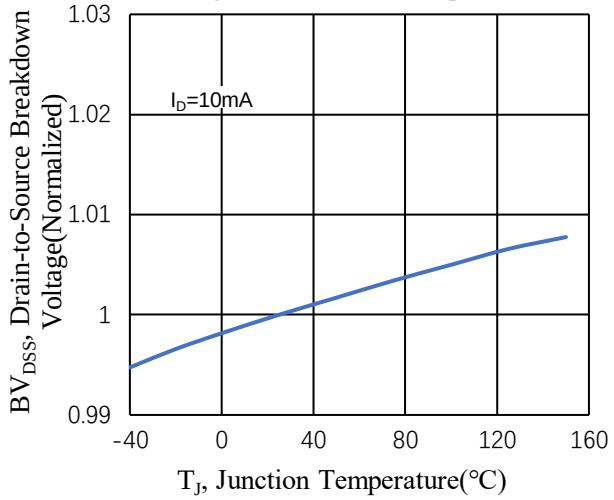
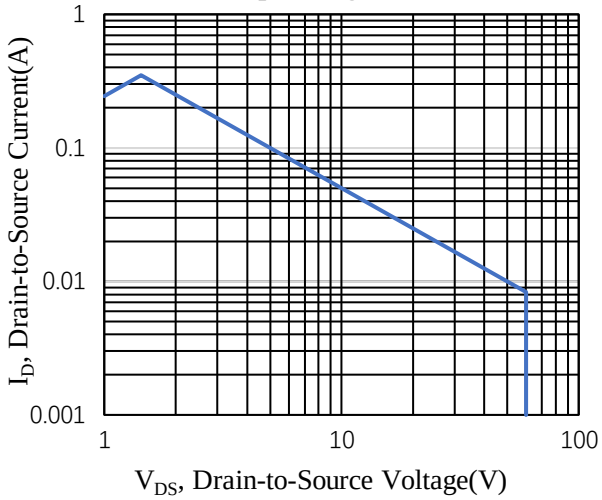
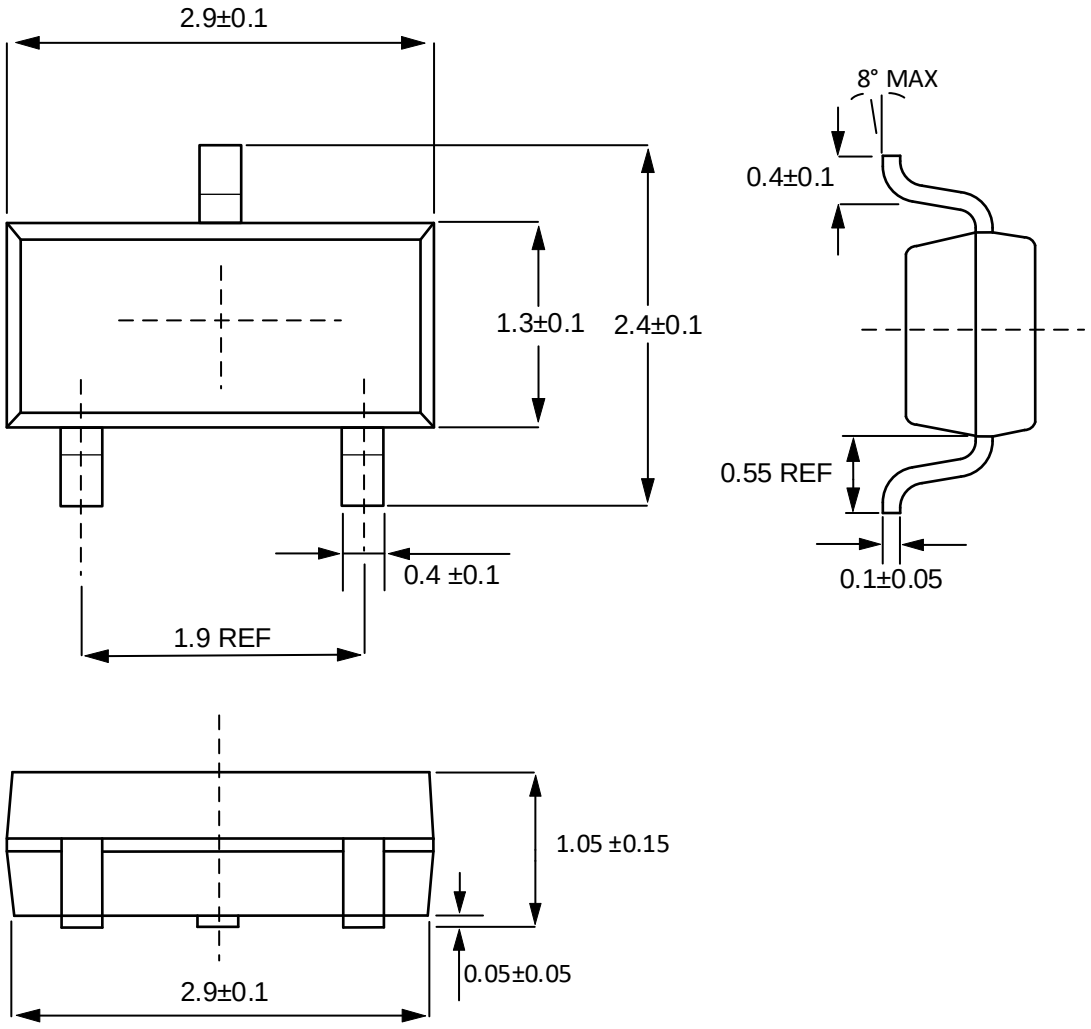


Figure 13. Maximum Forward Safe Operating Area



Package Dimensions

SOT-23



Unit：mm

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