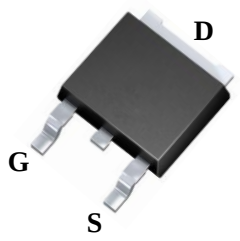
200V N-Channel Enhancement-Mode MOSFET

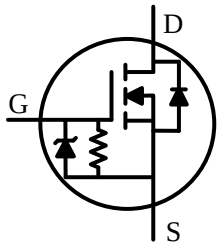
General Features

- Rugged Polysilicon Gate Cell Structure
- Integrated Gate-to-Source Resistor
- Integrated Gate-to-Source Zener Diode
- Low On-Resistance
- Low Threshold
- Low Input Capacitance
- Low Input and Output Leakage
- Fast Switching Speeds
- Free from Secondary Breakdown
- Halogen-free Available
- RoHS Compliant

BV_{DSX}	$R_{DS(ON)}$ (Max.)	I_D
200V	3Ω	2A

TO-252





Applications

- Amplifiers
- Buffers
- General Purpose Line Drivers
- High-Voltage Pulsers
- Logic-level Interfaces
- Piezoelectric Transducer Drivers

Ordering Information

Part Number	Package	Marking	Remark
FTD03N20G	TO-252	03N20	Halogen Free

Absolute Maximum Ratings

T_A=25°C unless otherwise specified

Symbol	Parameter	FTD03N20G	Unit
V_{DSX}	Drain-to-Source Voltage [1]	200	V
V_{DGX}	Drain-to-Gate Voltage [1]	200	V
I_D	Continuous Drain Current	2	A
I_{DM}	Pulsed Drain Current [2]	6	
P_D	Power Dissipation	36	W
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	

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

Thermal Characteristics

Symbol	Parameter	FTD03N20G	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	3.47	°C/W

Electrical Characteristics

OFF Characteristics

T_A =25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSX}	Drain-to-Source Breakdown Voltage	200	--	--	V	V_{GS}=0V, I_D=250μA
I_{DSS}	Drain-to-Source Leakage Current	--	--	10	μA	V_{DS}=200V, V_{GS}=0V
R_{GS}	Gate-to-source Shunt Resistor	10	--	50	kΩ	I_{GS} = 100μA
VZ_{GS}	Gate-to-Source Zener Voltage	13	--	25	V	I_{GS} = 2mA

ON Characteristics

T_A =25℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$I_{D(ON)}$	On-state Drain-to-Source Current	1	--	--	A	V_{GS}=4.5V, V_{DS}=25V
		2	--	--	A	V_{GS}=10V, V_{DS}=25V
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	--	3	Ω	V_{GS}=4.5V, I_D=150mA [3]
		--	--	4	Ω	V_{GS}=10V, I_D=1A [3]
$V_{GS(TH)}$	Gate Threshold Voltage	1.0	--	2.4	V	V_{GD}=0V, I_D=250μA
gfs	Forward Transconductance	--	1.0	--	S	V_{DS}=25V, I_D=500mA

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{iss}	Input Capacitance	--	178.2	--	pF	V_{GS}=0V V_{DS}=25V f=1.0MHz
C_{oss}	Output Capacitance	--	34.0	--		
C_{rss}	Reverse Transfer Capacitance	--	3.82	--		
Q_g	Total Gate Charge	--	5.15	--	nC	V_{GS}=10V V_{DD}=25V I_D=1A
Q_{gs}	Gate-to-Source Charge	--	0.76	--		
Q_{gd}	Gate-to-Drain (Miller) Charge	--	0.52	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time	--	5.2	--	ns	V_{GS}=10V V_{DD}=25V I_D=1A R_G=25Ω
t_{rise}	Rise Time	--	2.6	--		
$t_{d(off)}$	Turn-off Delay Time	--	15	--		
t_{fall}	Fall Time	--	4.4	--		

Source-Drain Diode Characteristics

T_A=25℃ unless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Unit	Test Conditions
V_{SD}	Diode Forward Voltage	--	--	1.8	V	I_{SD}=500mA, V_{GS}=0V

NOTE:

[1] T_J=+25℃ to +150℃.
[2] Repetitive rating, pulse width limited by maximum junction temperature.
[3] Pulse width≤380μs, duty cycle≤2%.

Typical Characteristics

Figure 1. Maximum Power Dissipation vs. Case Temperature

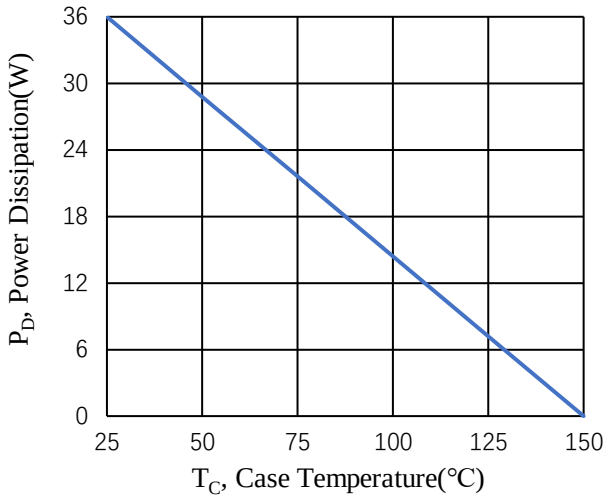


Figure 2. Maximum Continuous Drain Current vs. Case Temperature

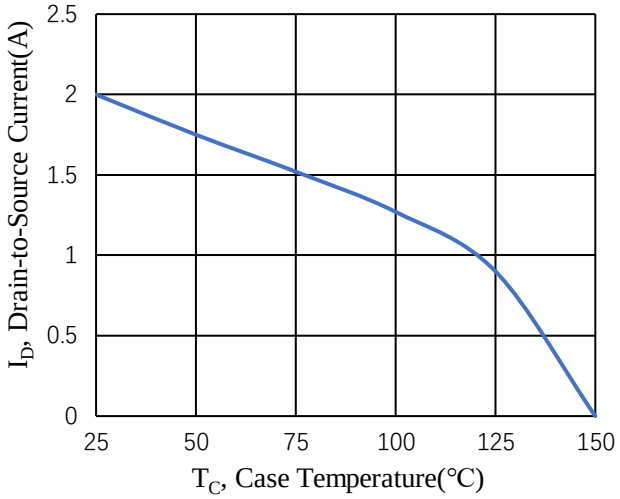


Figure 3.Typical Output Characteristics

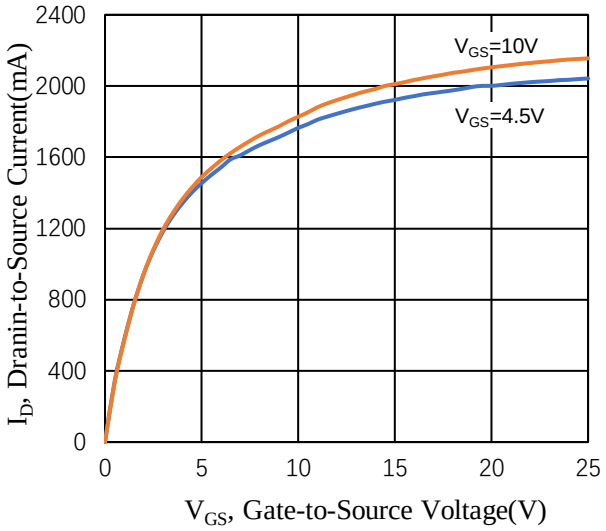


Figure 4. Typical Transfer Characteristics

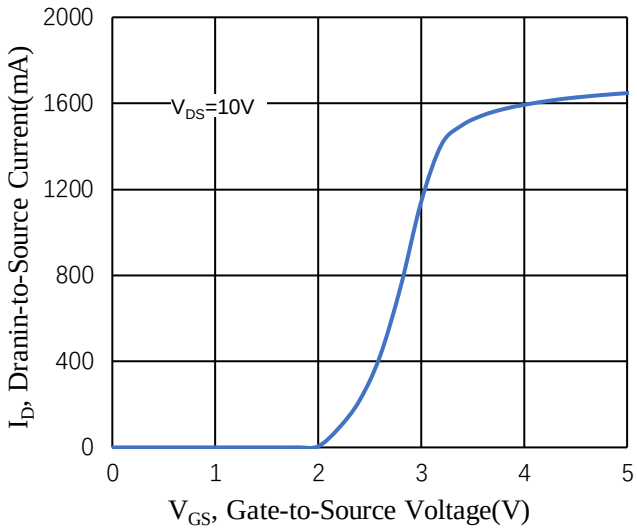


Figure 5. Typical Capacitance vs. Drain-to-Source Voltage

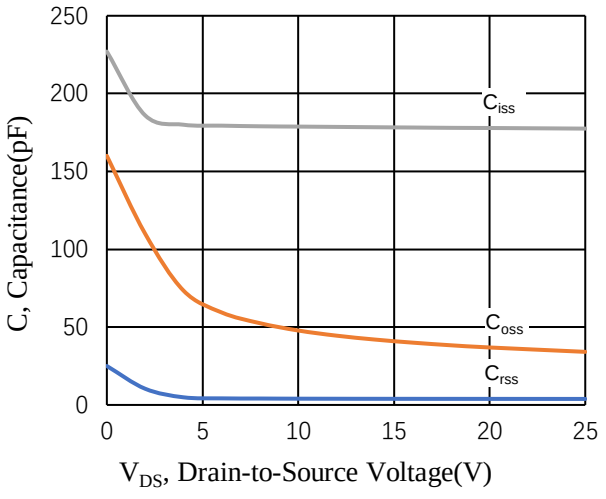


Figure 6. Typical Gate Charge vs. Gate-to-Source Voltage

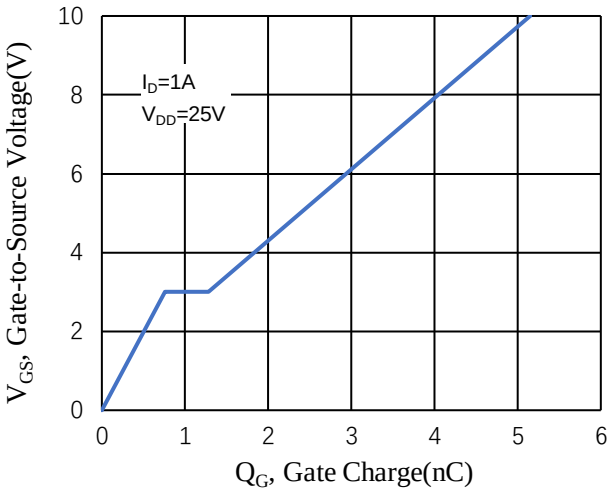


Figure 7. Threshold Voltage vs.Temperature

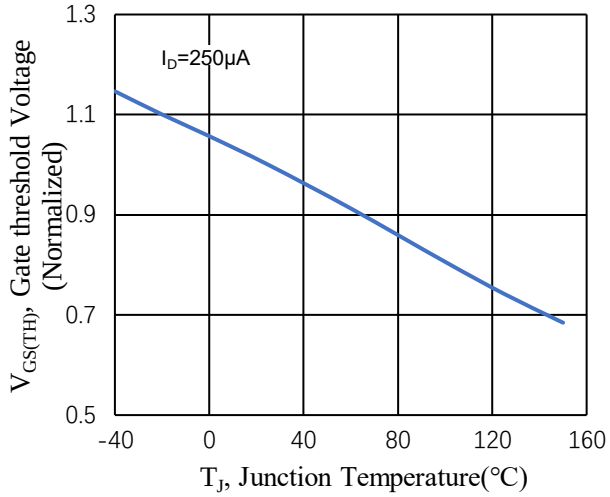


Figure 8. On-Resistance vs. Junction Temperature

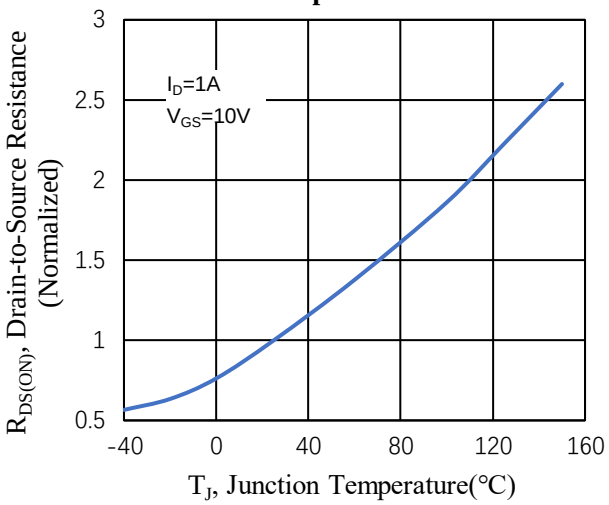


Figure 9. Drain-to-Source Breakdown Voltage vs. Junction Temperature

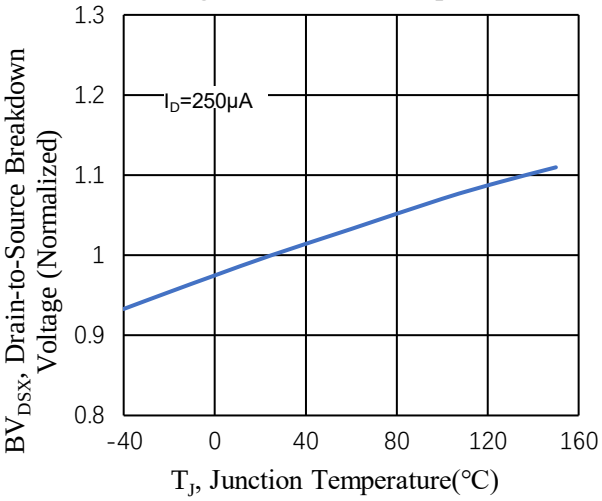
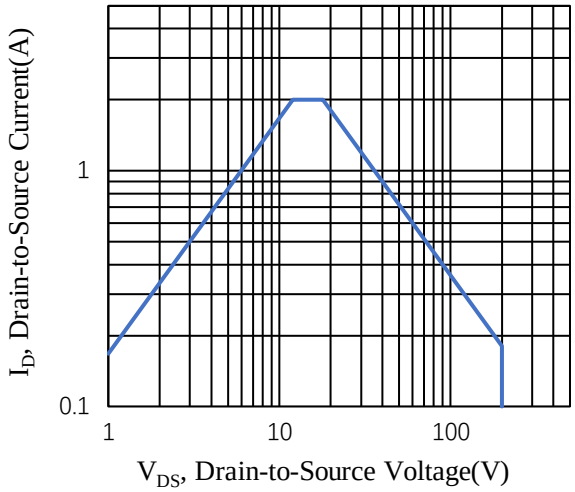
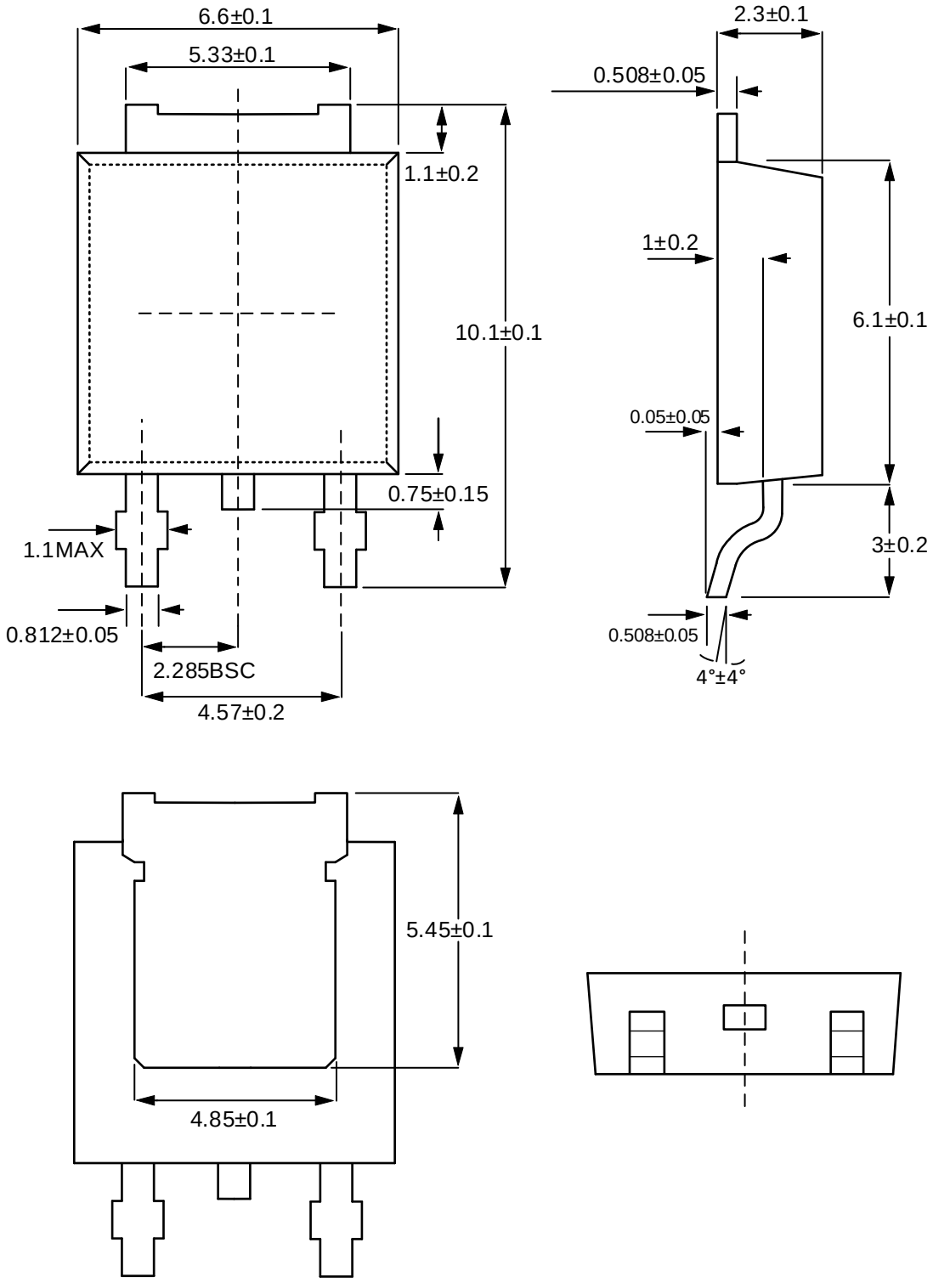


Figure 10. Maximum Forward Safe Operating Area



Package Dimensions

TO-252



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