

200V N-Channel Enhancement Mode MOSFET

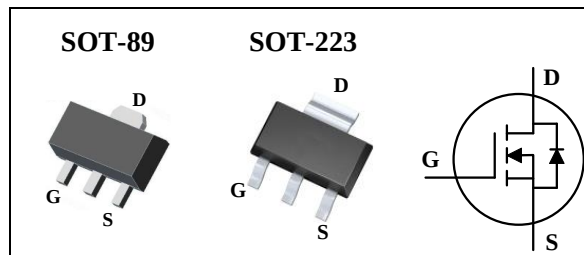
General Features

- Simple Drive Requirements
- Fast Switching
- Ease of Paralleling
- RoHS Compliant
- Halogen-free Available

BV_{DSS}	$R_{DS(on)(Max.)}$	$V_{GS(th)}$
200V	1.9Ω	1V - 3V

Applications

- High Efficiency Switching
- DC/DC Converters
- DC/AC Converters for Uninterrupted Power Supply
- Motor Control



Ordering Information

Part Number	Package	Marking	Remark
FTX02N20G	SOT-89	02N20	Halogen Free
FTS02N20G	SOT-223	02N20	Halogen Free

Absolute Maximum Ratings

$T_A = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	FTX02N20G	FTS02N20G	Unit
V_{DSS}	Drain-to-Source Voltage ^[1]	200		V
V_{GS}	Gate-to-Source Voltage	± 20		V
I_D	Continuous Drain Current ^[2]	0.6	0.7	A
I_{DM}	Pulsed Drain Current ^[3]	2.4	2.8	A
P_D	Power Dissipation ^[4]	1.0	1.5	W
T_L	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300		$^\circ\text{C}$
T_J & T_{STG}	Operating and Storage Temperature Range	-55 to 150		$^\circ\text{C}$

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

Thermal Characteristics

Symbol	Parameter	FTX02N20G	FTS02N20G	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	125	53	$^\circ\text{C/W}$

Electrical Characteristics

OFF Characteristics

 $T_A = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSS}	Drain-to-Source Breakdown Voltage	200	--	--	V	$V_{GS} = 0V, I_D = 250\mu A$
I_{DSS}	Drain-to-Source Leakage Current	--	--	1	μA	$V_{DS} = 200V, V_{GS} = 0V$
I_{GSS}	Gate-to-Source Leakage Current	--	--	100	nA	$V_{GS} = 20V, V_{DS} = 0V$
		--	--	-100		$V_{GS} = -20V, V_{DS} = 0V$

ON Characteristics

 $T_A = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	--	--	1.9	Ω	$V_{GS} = 4.5V, I_D = 0.5A$ [5]
		--	--	1.4		$V_{GS} = 10V, I_D = 0.5A$ [5]
$V_{GS(th)}$	Gate Threshold Voltage	1	--	3	V	$V_{GD} = 0V, I_D = 250\mu A$
g_{fs}	Forward Transconductance	--	1.4	--	S	$V_{DS} = 10V, I_D = 0.5A$

Dynamic Characteristics

 $T_A = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{iss}	Input Capacitance	--	196	--	pF	$V_{GS} = 0V,$ $V_{DS} = 25V,$ $f = 1.0MHz$
C_{oss}	Output Capacitance	--	35	--		
C_{rss}	Reverse Transfer Capacitance	--	5	--		
Q_g	Total Gate Charge	--	4.75	--	nC	$V_{GS} = 0 \text{ to } 10V,$ $V_{DS} = 100V,$ $I_D = 0.8A$
Q_{gs}	Gate-to-Source Charge	--	0.92	--		
Q_{gd}	Gate-to-Drain (Miller) Charge	--	1.23	--		

Resistive Switching Characteristics

 $T_A = 25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time	--	6	--	ns	$V_{GS} = 10V,$ $V_{DD} = 100V,$ $I_D = 0.8A,$ $R_G = 6\Omega$
t_r	Rise Time	--	3.4	--		
$t_{d(off)}$	Turn-off Delay Time	--	17.6	--		
t_f	Fall Time	--	17.8	--		



FTX02N20G/FTS02N20G

Provisional Datasheet

Source-Drain Diode Characteristics

$T_A = 25^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Unit	Test Conditions
V_{SD}	Diode Forward Voltage	--	--	1.2	V	$I_{SD} = 0.8\text{A}$, $V_{GS} = 0\text{V}$

NOTE:

[1] $T_J = +25^{\circ}\text{C}$ to $+150^{\circ}\text{C}$.

[2] $T_C = +25^{\circ}\text{C}$.

[3] Repetitive rating, pulse width limited by maximum junction temperature.

[4] $T_C = +25^{\circ}\text{C}$.

[5] Pulse width $\leq 380\mu\text{s}$, duty cycle $\leq 2\%$.

Typical Characteristics

Figure 1. Maximum Power Dissipation vs. Case Temperature

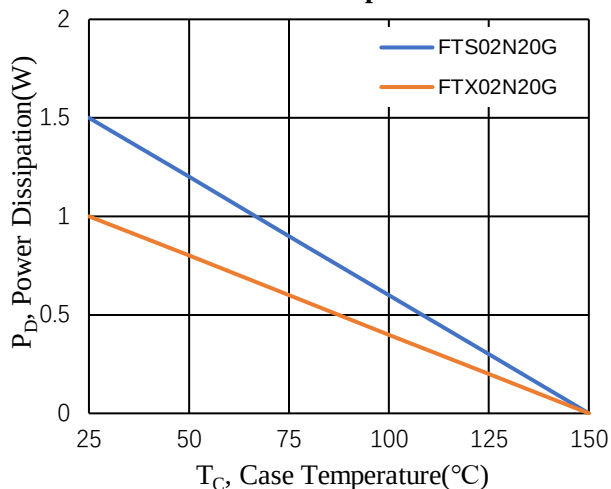


Figure 2. Maximum Continuous Drain Current vs. Case Temperature

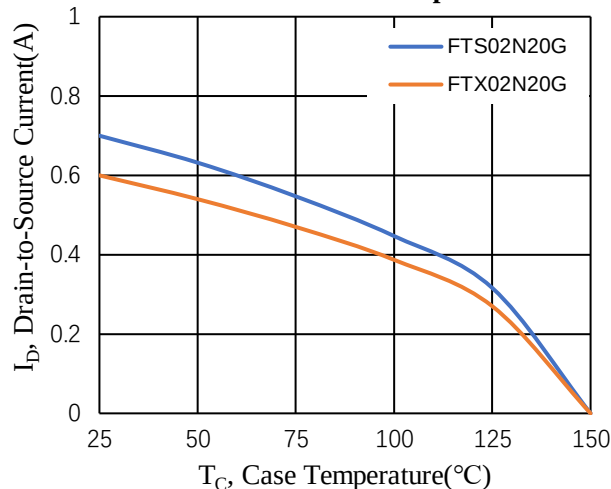


Figure 3. Typical Output Characteristics

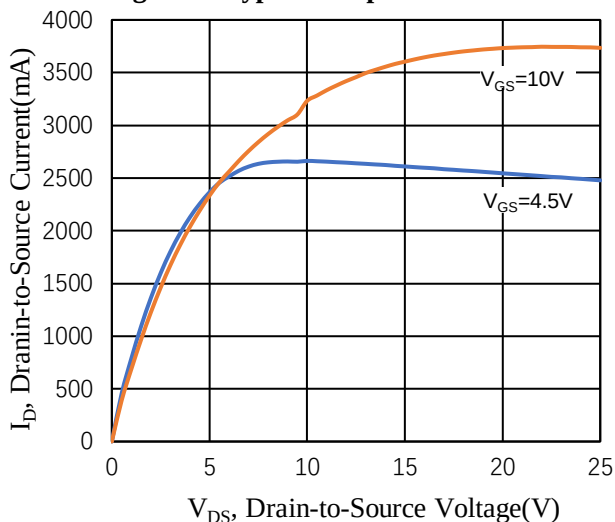


Figure 4. Typical Transfer Characteristics

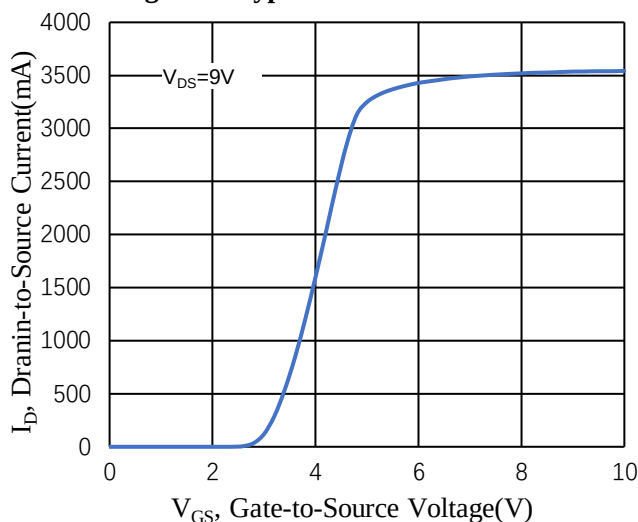


Figure 5. Typical Capacitance vs. Drain-to-Source Voltage

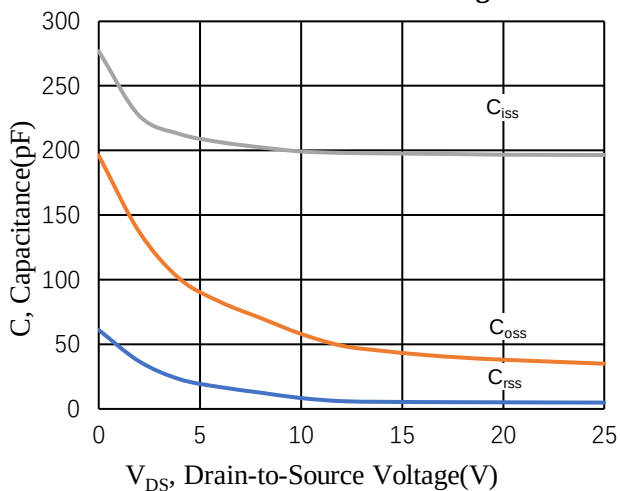


Figure 6. Typical Gate Charge vs. Gate-to-Source Voltage

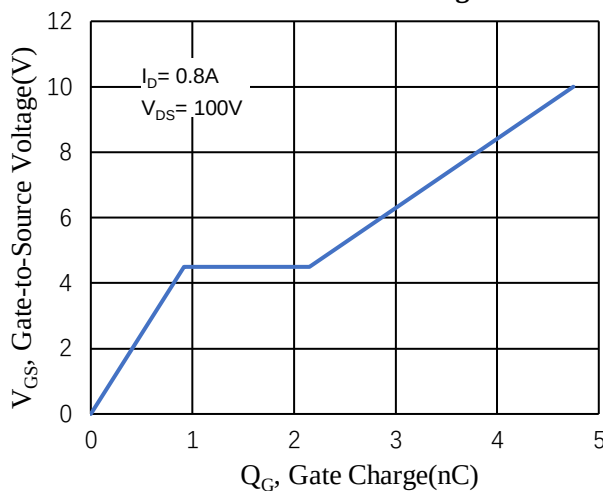


Figure 7. Threshold Voltage vs. Temperature

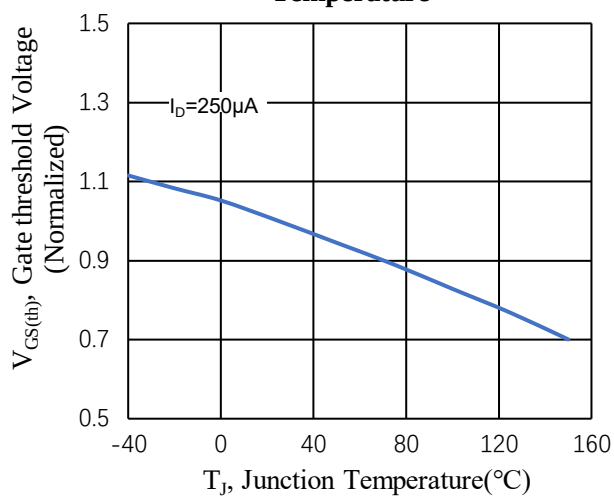


Figure 8. Normalized On-Resistance vs. Junction Temperature

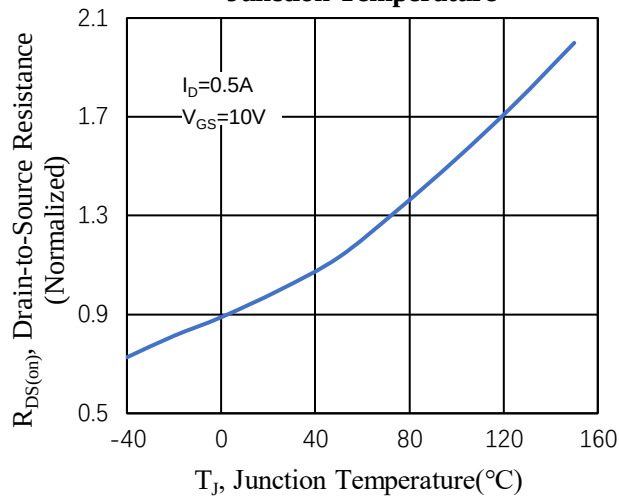


Figure 9. Drain-to-Source Breakdown Voltage vs. Junction Temperature

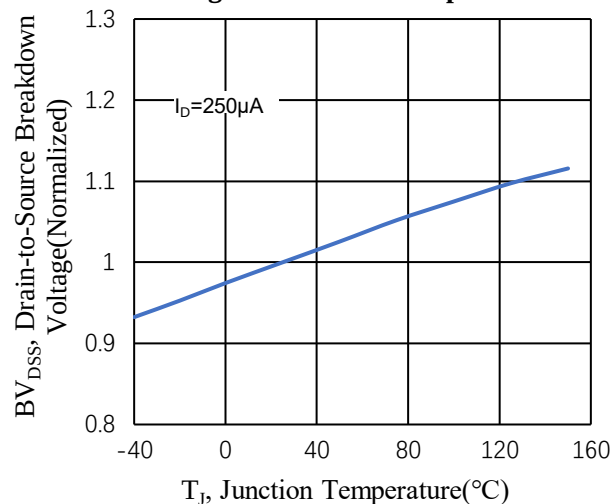
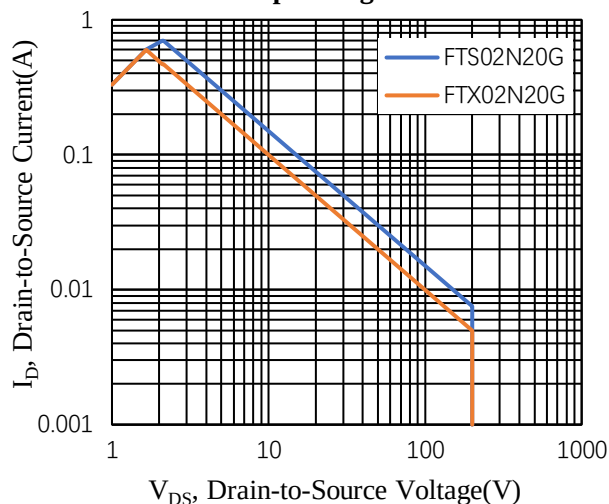
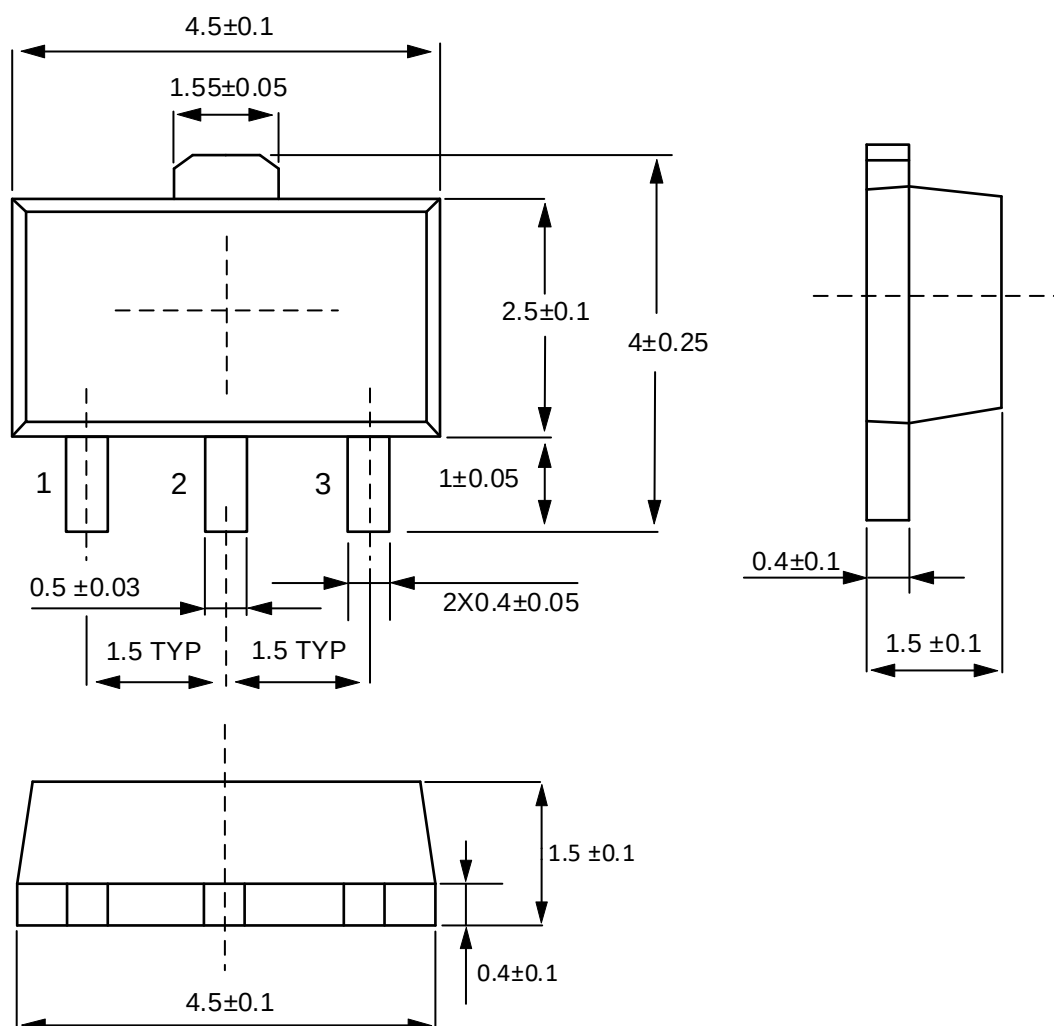


Figure 10. Maximum Forward Safe Operating Area

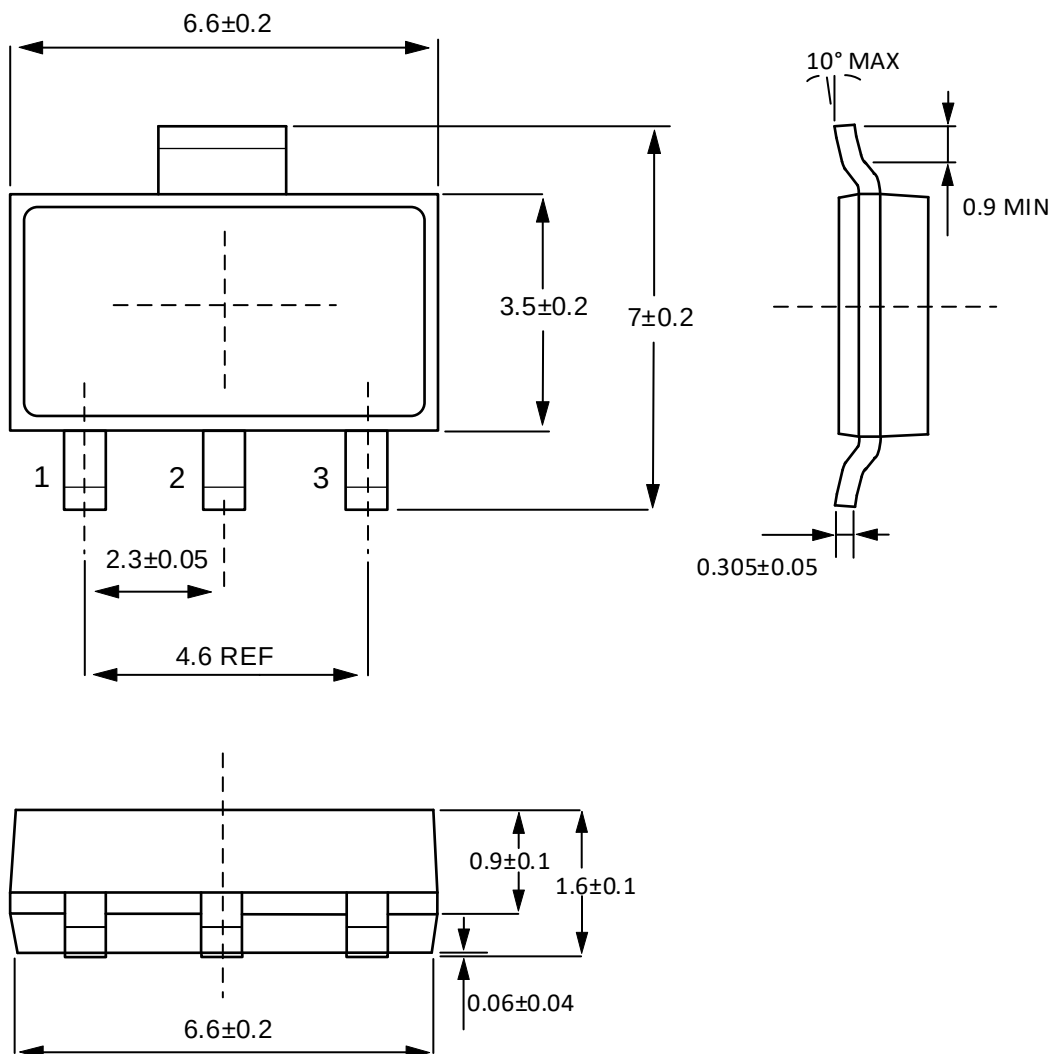


Package Dimensions

SOT-89



SOT-223





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