

150V N-Channel Enhancement Mode MOSFET

General Features

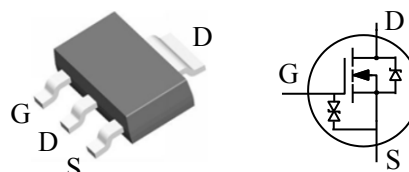
- ESD improved capability
- High dense cell design for extremely low $R_{DS(ON)}$.
- Rugged polysilicon gate cell structure
- RoHS compliant
- Halogen-free available

BV_{DSX}	$R_{DS(ON)}$ (Typ.)	I_D
150V	0.45 Ω	1.3A

SOT-223

Applications

- Relay driver
- High speed line driver
- Logic level translator



Ordering Information

Part Number	Package	Marking	Remark
FTS01N15G	SOT-223	01N15G	Halogen Free

Absolute Maximum Ratings

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

Symbol	Parameter	FTS01N15G	Unit
V_{DSX}	Drain-to-Source Voltage ^[1]	150	V
V_{DGX}	Drain-to-Gate Voltage ^[1]	150	V
I_D	Continuous Drain Current	1.3	A
I_{DM}	Pulsed Drain Current ^[2]	5.2	
P_D	Power Dissipation	1.5	W
	Derating Factor above 25°C	0.012	W/ $^\circ\text{C}$
V_{GS}	Gate-to-Source Voltage	± 20	V
V_{ESD}	Gate Source ESD ^[3]	6000	V
	Source to Gate ESD ^[3]	5000	
T_L	Soldering Temperature	300	$^\circ\text{C}$
	Distance of 1.6mm from case for 10 seconds		
T_J and 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	FTS01N15G	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	83.3	$^\circ\text{C}/\text{W}$

Electrical Characteristics

OFF Characteristics

TA =25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV _{DSX}	Drain-to-Source Breakdown Voltage	150	--	--	V	V _{GS} =0V, I _D =250μA
I _{DSS}	Drain-to-Source Leakage Current	--	--	1	μA	V _{DS} =150V, V _{GS} =0V
I _{GSS}	Gate-to-Source Leakage Current	--	--	20	μA	V _{GS} =+20V, V _{DS} =0V
		--	--	-20		V _{GS} =-20V, V _{DS} =0V

ON Characteristics

TA =25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
R _{DS(ON)}	Static Drain-to-Source On-Resistance	--	0.45	1	Ω	V _{GS} =5V, I _D =1A [4]
V _{GS(th)}	Gate Threshold Voltage	1.5	--	2.5	V	V _{GD} =0V, I _D =250μA
gfs	Forward Transconductance	--	860	--	mS	V _{DS} =5V, I _D =175mA

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C _{ISS}	Input Capacitance	--	320.5	--	pF	V _{GS} =0V V _{DS} =10V f=1.0MHZ
C _{OSS}	Output Capacitance	--	120.5	--		
C _{RSS}	Reverse Transfer Capacitance	--	27.4	--		
Q _G	Total Gate Charge	--	9.5	--	nC	V _{DS} =60V I _D =1.8A V _{GS} =5V
Q _{GS}	Gate-to-Source Charge	--	2.1	--		
Q _{GD}	Gate-to-Drain (Miller) Charge	--	3.8	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
t _{d(on)}	Turn-on Delay Time	--	6.5	--	ns	V _{GS} =10V V _{DD} =50V R _G =50 Ω R _D =250 Ω
t _{rise}	Rise Time	--	5.8	--		
t _{d(off)}	Turn-off Delay Time	--	67.0	--		
t _{fall}	Fall Time	--	16.0	--		

Source-Drain Diode Characteristics

TA =25°C unless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Unit	Test Conditions
V _{SD}	Diode Forward Voltage	--	--	1.2	V	I _{SD} =1A ^[4] , V _{GS} =0V

NOTE:

[1] T_J=+25°C to +150°C

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

[3] The test is based on JEDEC EIA/JESD22-A114 (HBM).

[4] Pulse width≤380μs; duty cycle≤2%.

Typical Characteristics

Figure 1. Maximum Power Dissipation vs. Case Temperature

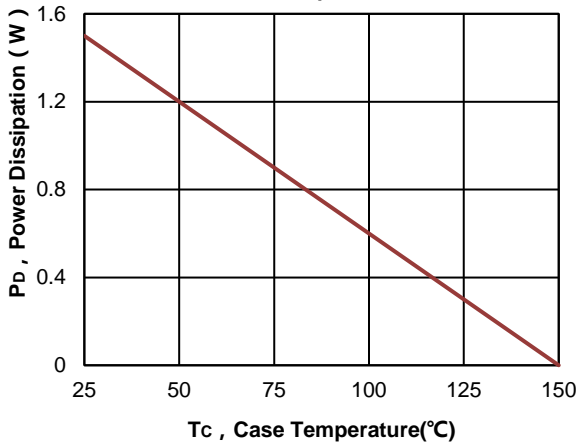


Figure 2. Maximum Continuous Drain Current vs. Case Temperature

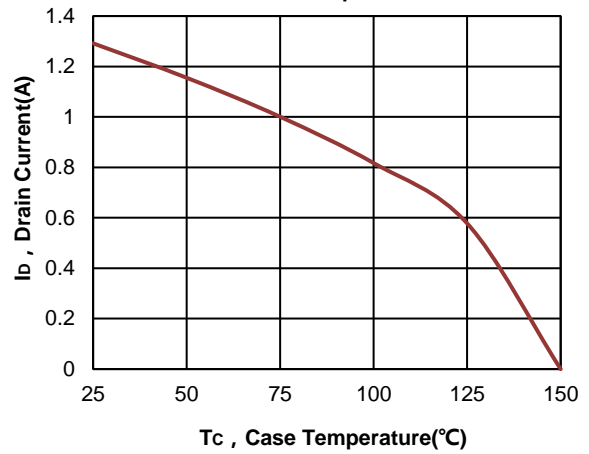


Figure 3. Typical Output Characteristics

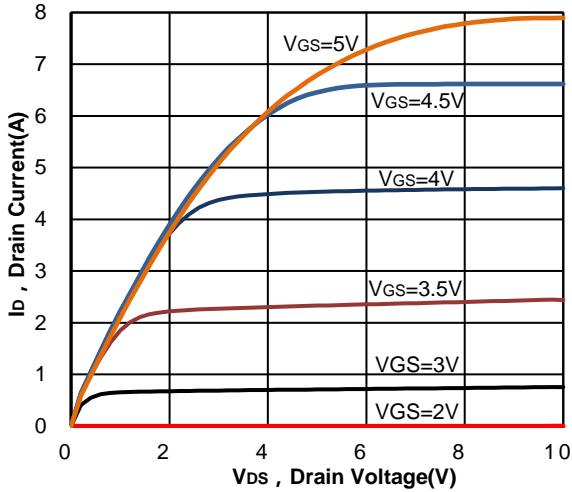


Figure 4. Typical Transfer Characteristics

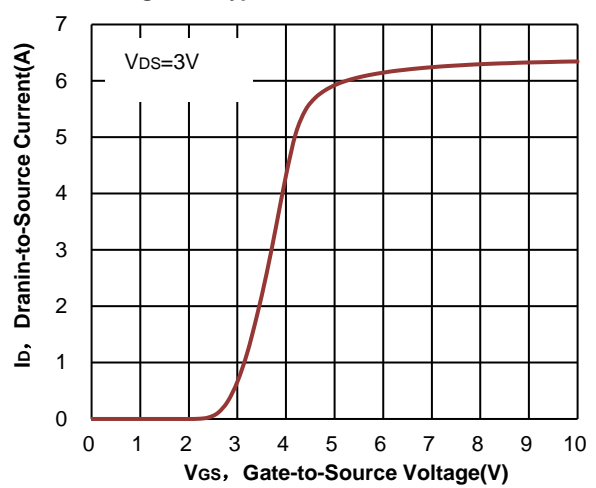


Figure 5. Typical Capacitance vs. Drain-to-Source Voltage

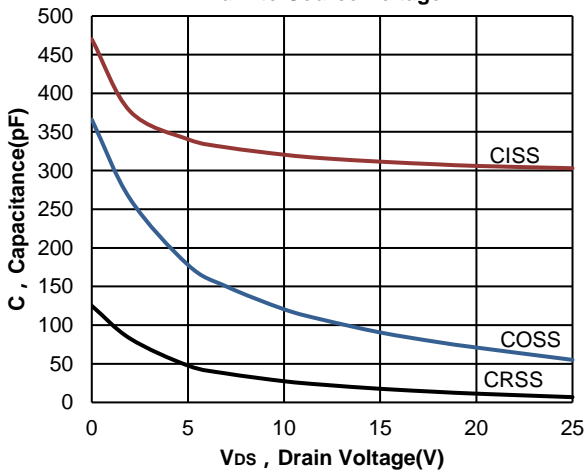


Figure 6. Typical Gate Charge vs. Gate-to-Source Voltage

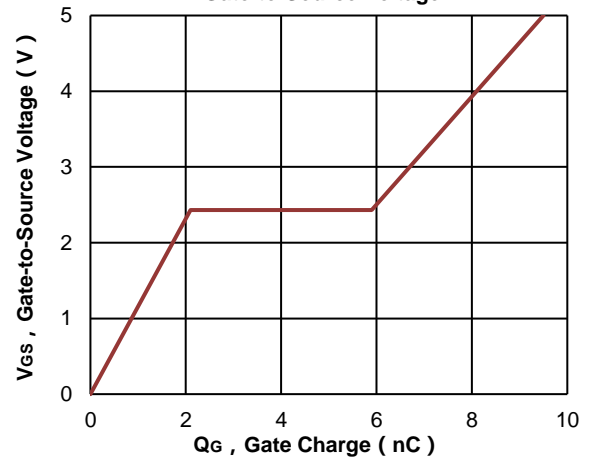
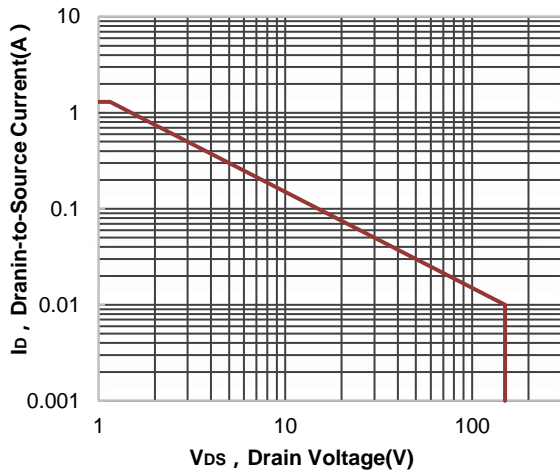
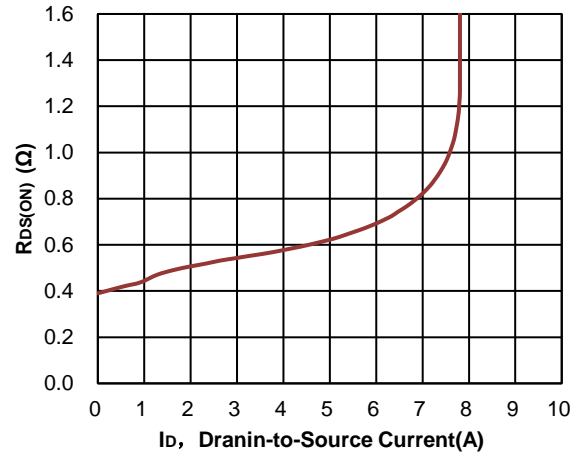
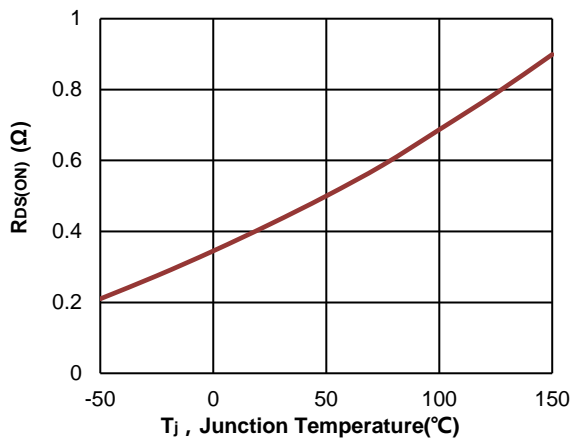
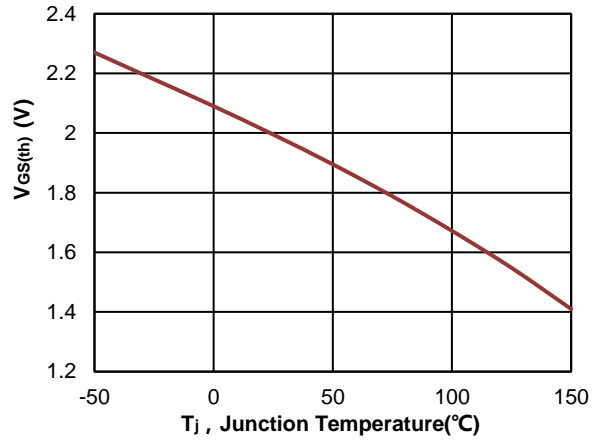
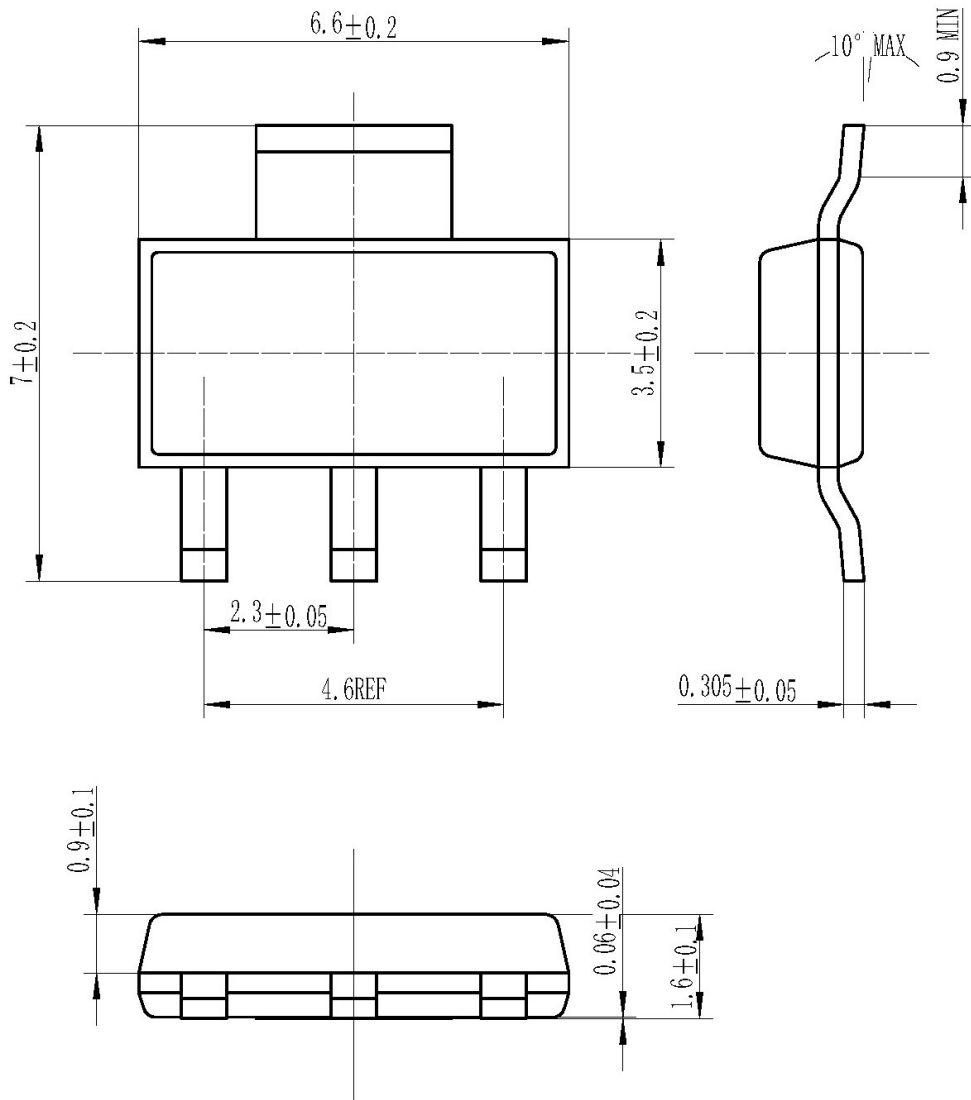


Figure 7. Maximum Rated Safe Operating Area

Figure 8. Drain-to-Source On-Resistance vs. Drain Current

Figure 9. Drain-to-Source On-Resistance vs. Junction Temperature

Figure 10. Gate Threshold Voltage vs. Junction Temperature


Package Dimensions
SOT-223


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