

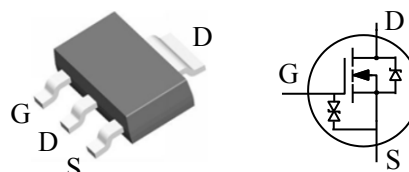
150V N-Channel Enhancement Mode MOSFET

General Features

- ESD Improved Capability
- Proprietary Advanced Planar Technology
- Rugged Polysilicon Gate Cell Structure
- Fast Switching Speed
- RoHS Compliant
- Halogen-free Available

BV_{DSX}	$R_{DS(ON)}$ (Typ.)	I_D
150V	5 Ω	0.35A

SOT-223



Applications

- Relay Driver
- High Speed Line Driver
- Logic Level Translator

Ordering Information

Part Number	Package	Marking	Remark
FTS10N15G	SOT-223	10N15G	Halogen Free

Absolute Maximum Ratings

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

Symbol	Parameter	FTS10N15G	Unit
V_{DSX}	Drain-to-Source Voltage ^[1]	150	V
V_{DGX}	Drain-to-Gate Voltage ^[1]	150	V
I_D	Continuous Drain Current	0.35	A
I_{DM}	Pulsed Drain Current ^[2]	1.4	
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
$V_{ESD(G-S)}$	Gate-to-Source ESD IEC, C=150pF, R=330 Ω	2500	V
T_L	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300	$^\circ\text{C}$
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	FTS10N15G	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	83.3	$^\circ\text{C}/\text{W}$

Electrical Characteristics

OFF Characteristics

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

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
BV_{DSX}	Drain-to-Source Breakdown Voltage	150	--	--	V	$V_{GS}=0V, I_D=250\mu A$
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temperature Coefficient	--	0.15	--	V/°C	Reference to 25°C , $I_D=250\mu A$
I_{DSS}	Drain-to-Source Leakage Current	--	--	1	μA	$V_{DS}=150V, V_{GS}=0V$
		--	--	100	μA	$V_{DS}=120V, V_{GS}=0V$ $T_J=125^\circ\text{C}$
I_{GSS}	Gate-to-Source Leakage Current	--	--	10	μA	$V_{GS}=+20V, V_{DS}=0V$
		--	--	-10		$V_{GS}=-20V, V_{DS}=0V$

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	--	5	10	Ω	$V_{GS}=10V, I_D=250mA$ [3]
$V_{GS(th)}$	Gate Threshold Voltage	1.5	--	2.5	V	$V_{GD}=0V, I_D=250\mu A$
gfs	Forward Transconductance	--	360	--	mS	$V_{DS}=5V, I_D=175mA$ [3]

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{ISS}	Input Capacitance	--	32.8	--	pF	$V_{GS}=0V$ $V_{DS}=10V$ $f=1.0MHz$
C_{OSS}	Output Capacitance	--	17.2	--		
C_{RSS}	Reverse Transfer Capacitance	--	4.6	--		
Q_G	Total Gate Charge	--	1.2	--	nC	$V_{DS}=60V$ $I_D=250mA$ $V_{GS}=5V$
Q_{GS}	Gate-to-Source Charge	--	0.4	--		
Q_{GD}	Gate-to-Drain (Miller) Charge	--	0.7	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time	--	3.6	--	ns	$V_{DD}=50V$ $R_D=250\Omega$ $R_G=50\Omega$ $V_{GS}=10V$
t_{rise}	Rise Time	--	7.2	--		
$t_{d(off)}$	Turn-off Delay Time	--	16.0	--		
t_{fall}	Fall Time	--	36.8	--		

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	--	--	1.5	V	$I_{SD}=300\text{mA}$, $V_{GS}=0\text{V}$
I_{SD}	Continuous Source Current (Body Diode)	--	--	0.5	A	Integral P-N diode in MOSFET
I_{SM}	Maximum Pulsed Current (Body Diode)	--	--	2.0	A	

NOTE:

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

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

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

Typical Characteristics

Figure 1. Maximum Power Dissipation vs. Case Temperature

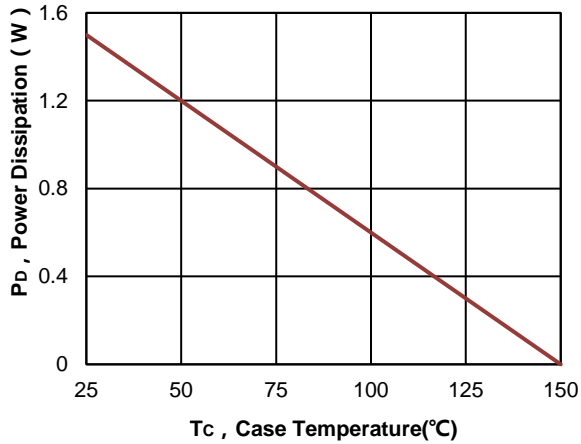


Figure 2. Maximum Continuous Drain Current vs Case Temperature

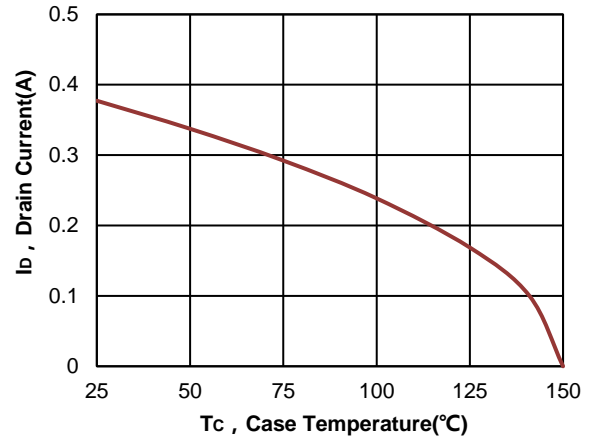


Figure 3. Typical Output Characteristics

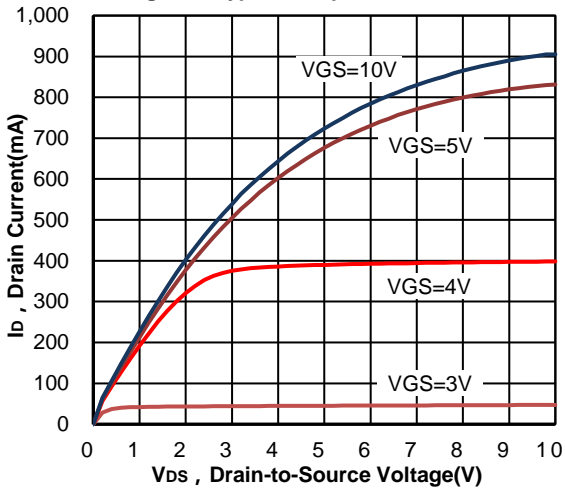


Figure 4. Typical Transfer Characteristics

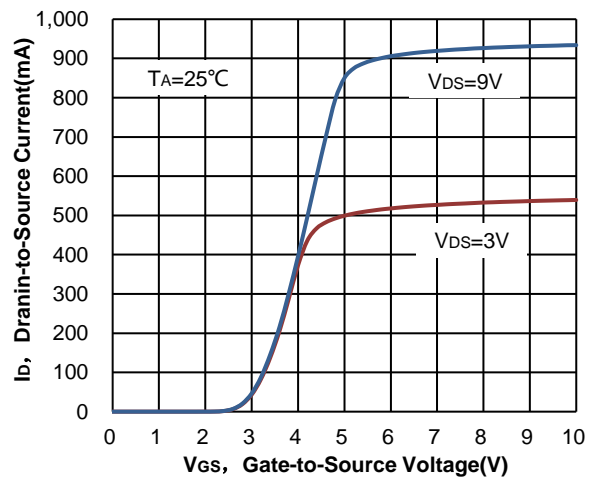


Figure 5. Typical Drain-to-Source On-Resistance vs. Junction Temperature

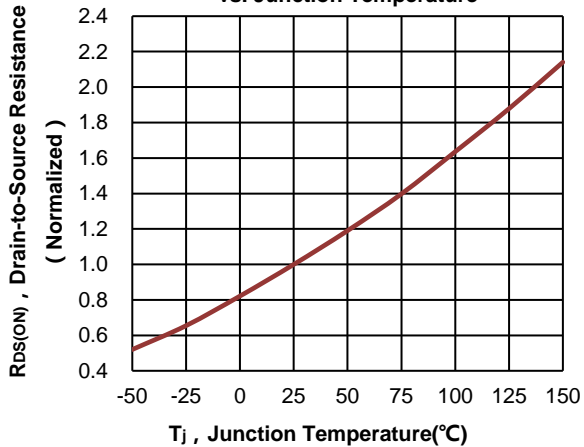


Figure 6. Typical Breakdown Voltage vs. Junction Temperature

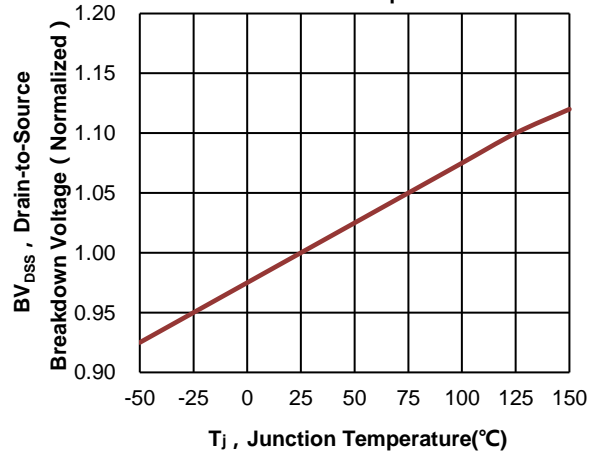
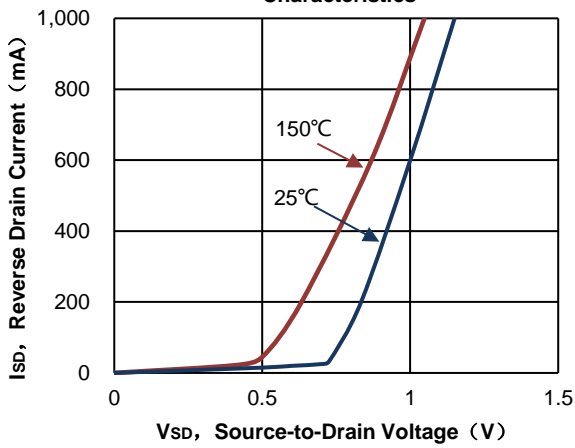
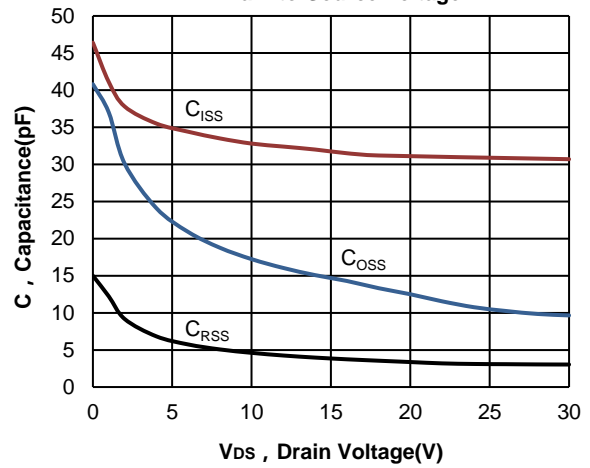
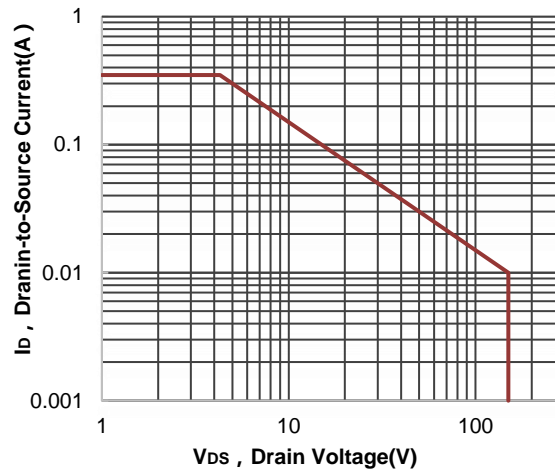
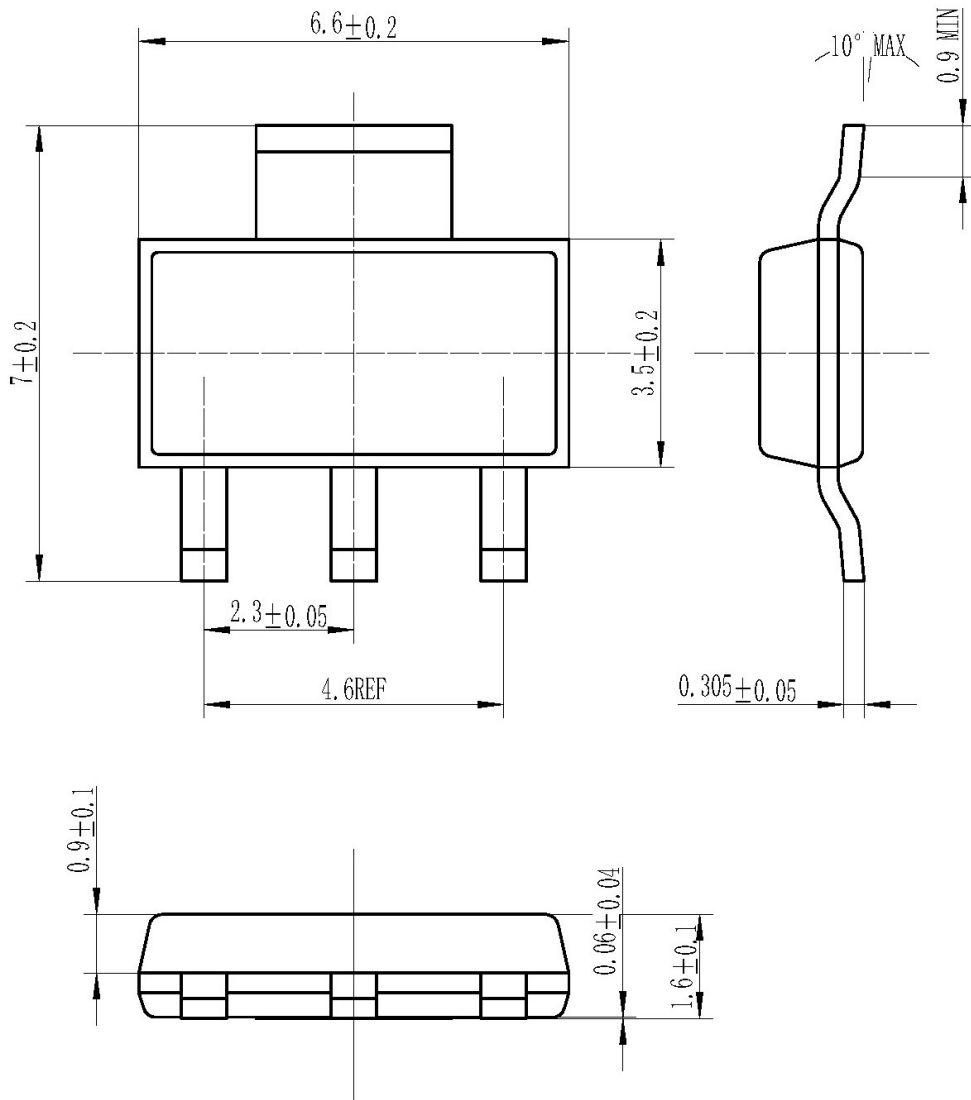


Figure 7. Typical Body Diode Transfer Characteristics

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

Figure 9. Maximum Forward Safe Operating Area


Package Dimensions**SOT-223**

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