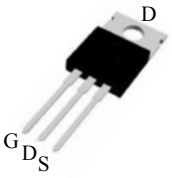
150V P-Channel Enhancement Mode MOSFET

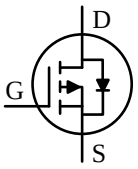
General Features

- High Dense Cell Design for Low $R_{DS(ON)}$
- Rugged Polysilicon Gate Cell Structure
- RoHS Compliant
- Halogen-free Available
- 100% Avalanche Tested

Part Number	BV_{DSX}	$R_{DS(ON)}$ (Typ.)	I_D
FTE02P15G	-150V	0.20 Ω	-2.3A
FTP02P15G	-150V	0.20 Ω	-15A

TO-220AB SOP-8





Applications

- Reset Switch for Active Clamp Reset
- DC-DC Converters

Ordering Information

Part Number	Package	Marking	Remark
FTE02P15G	SOP-8	02P15	Halogen Free
FTP02P15G	TO-220AB	02P15	Halogen Free

Absolute Maximum Ratings

T_A =25℃ unless otherwise

Symbol	Parameter	FTE02P15G	FTP02P15G	Unit
V_{DSX}	Drain-to-Source Voltage[1]	-150	-150	V
V_{DGX}	Drain-to-Gate Voltage[1]	-150	-150	V
I_D	Continuous Drain Current	-2.3	-15	A
I_{DM}	Pulsed Drain Current[2]	-9.2	-60	
P_D	Power Dissipation	2.5	100	W
	Derating Factor above 25℃	0.02	0.8	W/℃
V_{GS}	Gate-to-Source Voltage	±20		V
E_{AS}	Single Pulse Avalanche Energy[3]	200		mJ
I_{AR}	Avalanche Current[2]	-4.0		A
T_L	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300		℃
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	FTE02P15G	FTP02P15G	Unit
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	50	1.25	℃/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	-150	--	--	V	V_{GS}=0V, I_{DS}=-250μA
I_{DSS}	Drain-to-Source Leakage Current	--	--	-1	μA	V_{DS}=-150V，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℃ unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	0.20	0.30	Ω	V_{GS}=-10V，I_{DS}=-1.3A [4]
$V_{GS(th)}$	Gate Threshold Voltage	-1.8	--	-4.0	V	V_{GD}=0V, I_{DS}=-250μA
gfs	Forward Transconductance	--	4.5	--	S	V_{DS}=-50V, I_{DS}=-1.3A

Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
C_{iss}	Input Capacitance	--	1420	--	pF	V_{GS}=0V V_{DS}=-25V f=1.0MHZ
C_{oss}	Output Capacitance	--	180.5	--		
C_{rss}	Reverse Transfer Capacitance	--	38.4	--		
Q_g	Total Gate Charge	--	35.1	--	nC	V_{DS}=-120V I_D=-1.3A V_{GS}=-10V
Q_{gs}	Gate-to-Source Charge	--	9.6	--		
Q_{gd}	Gate-to-Drain (Miller) Charge	--	13.8	--		

Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time	--	16.5	--	ns	V_{GS}=-10V V_{DD}=-75V R_G=6.5Ω I_D=-1.3A
t_{rise}	Rise Time	--	14.6	--		
$t_{d(off)}$	Turn-off Delay Time	--	35.0	--		
t_{fall}	Fall Time	--	24.6	--		

Source-Drain Diode Characteristics

T_A =25℃ unless otherwise specified

Symbol	Parameter	Min	Typ.	Max.	Unit	Test Conditions
V_{SD}	Diode Forward Voltage	--	--	1.5	V	I_{SD}=1.3A, V_{GS}=0V

NOTE：

[1] T_J=+25℃ to +150℃.
[2] Repetitive rating, pulse width limited by maximum junction temperature.
[3] L=25mH,R_G=25Ω,I_{AS}=-4.0A,Starting T_J=25°C.
[4] Pulse width≤380μs; duty cycle≤2%.

Typical Characteristics

Figure 1. Maximum Power Dissipation vs. Case Temperature

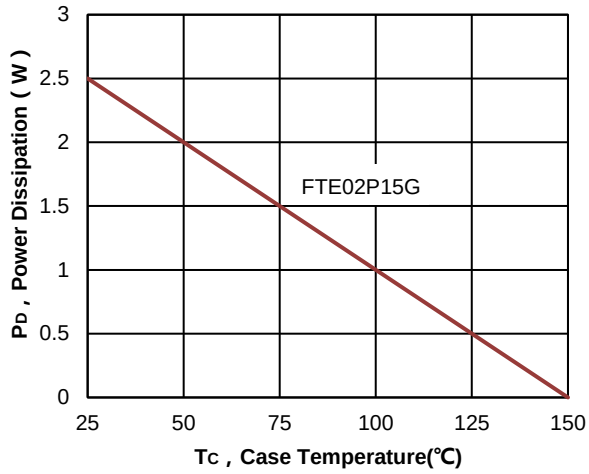


Figure 2. Maximum Power Dissipation vs. Case Temperature

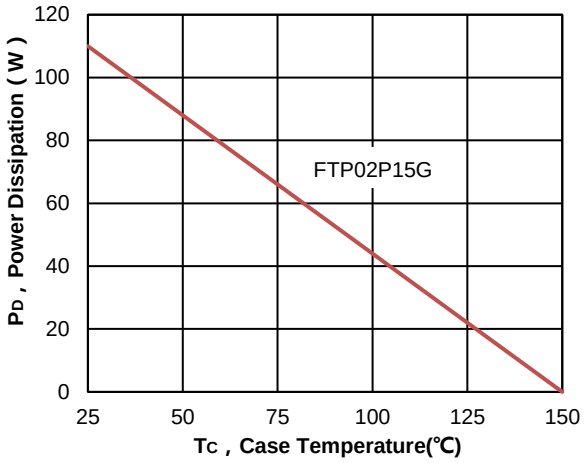


Figure 3. Maximum Continuous Drain Current vs. Case Temperature

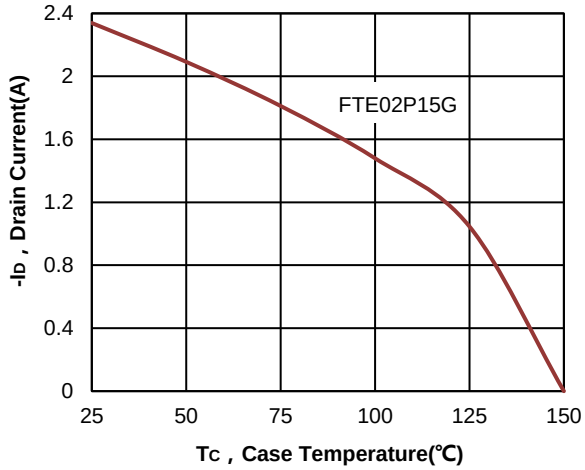


Figure 4. Maximum ContinuousDrain Current vs Case Temperature

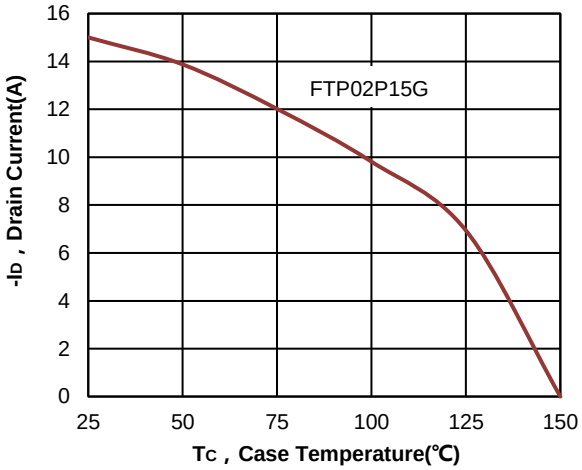


Figure 5.Typical Output Characteristics

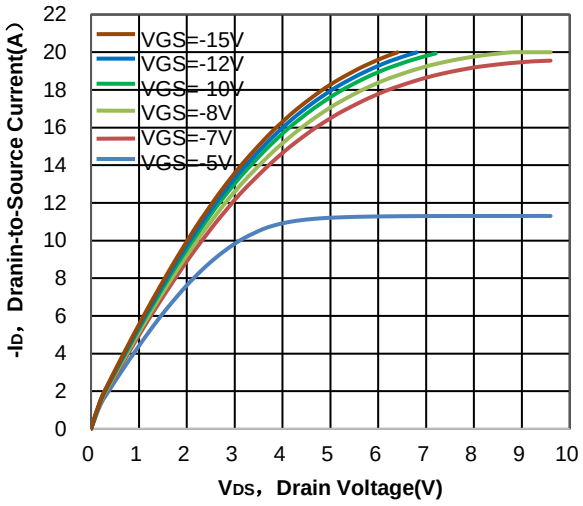


Figure 6. Typical Transfer Characteristics

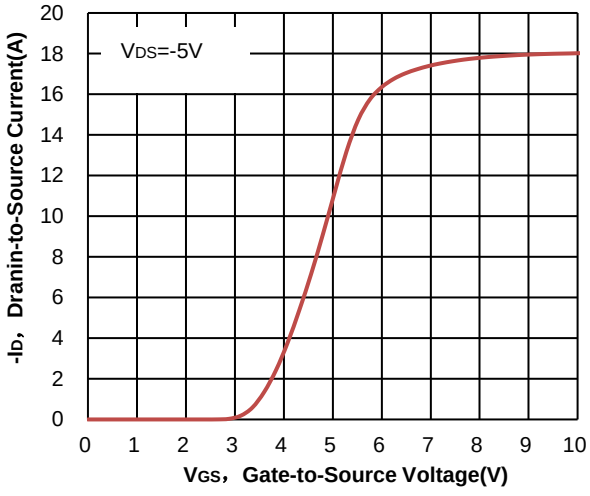


Figure 7. Typical Capacitance vs. Drain-to-Source Voltage

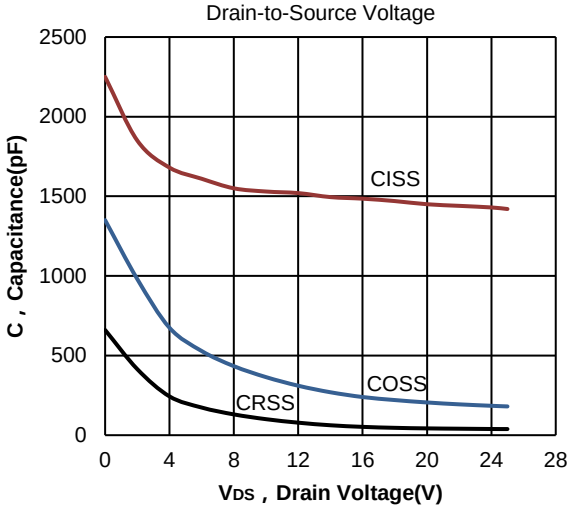


Figure 8. Typical Gate Charge vs. Gate-to-Source Voltage

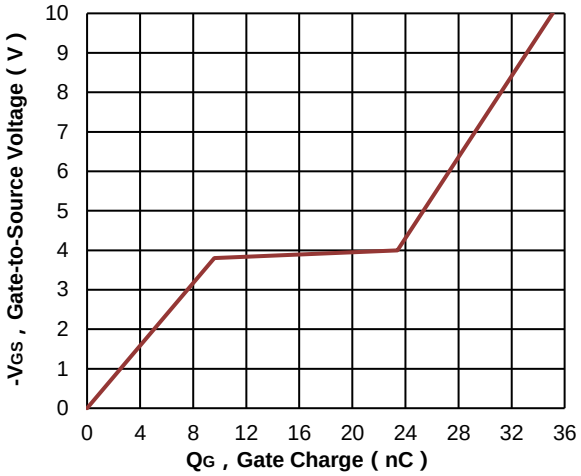


Figure 9. Maximum Rated Safe Operating Area

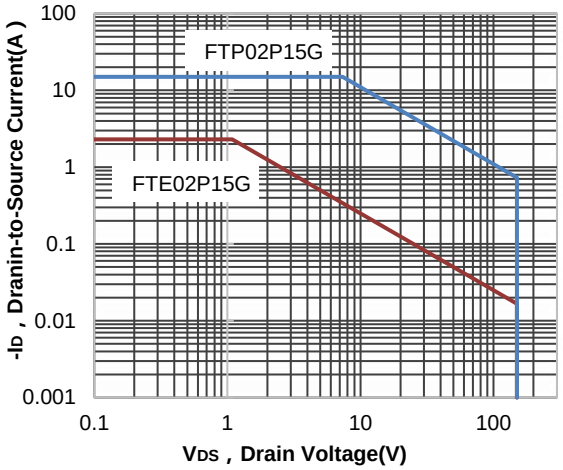


Figure 10. Drain-to-Source On-Resistance vs. Drain Current

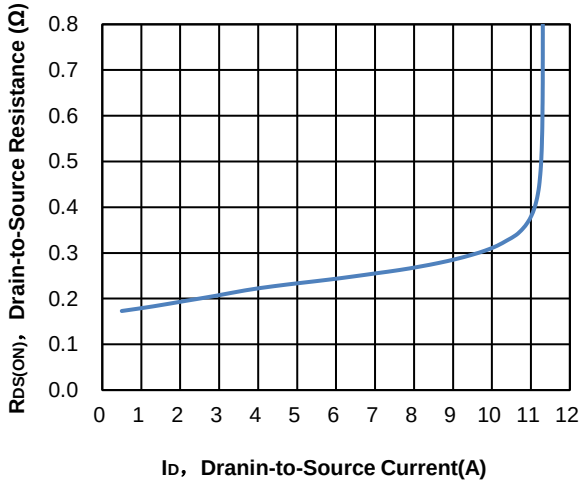


Figure 11. Drain-to-Source On-Resistance vs. Junction Temperature

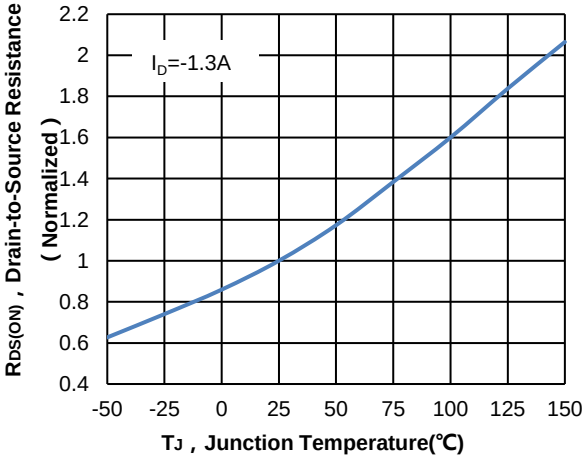
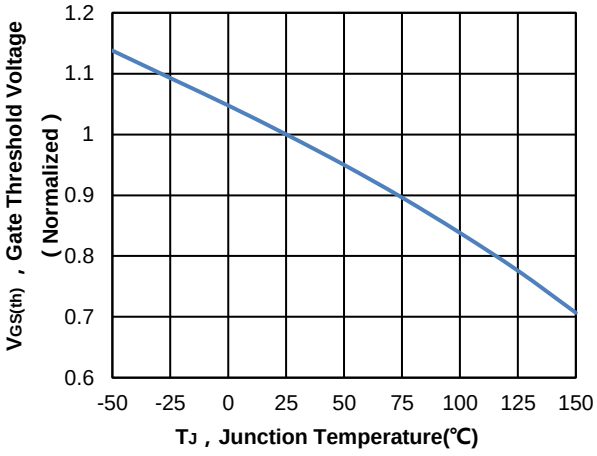
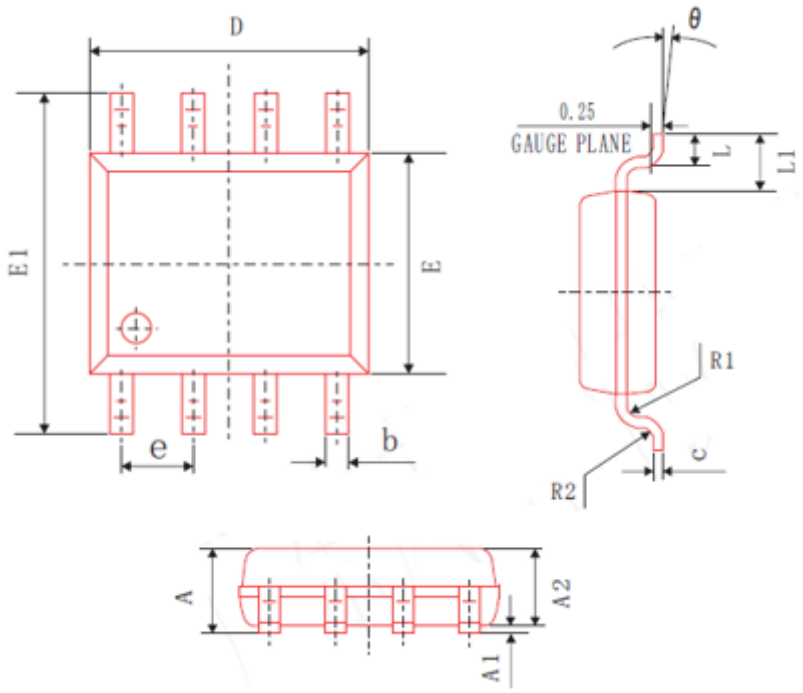


Figure 12. Gate Threshold Voltage vs. Junction Temperature



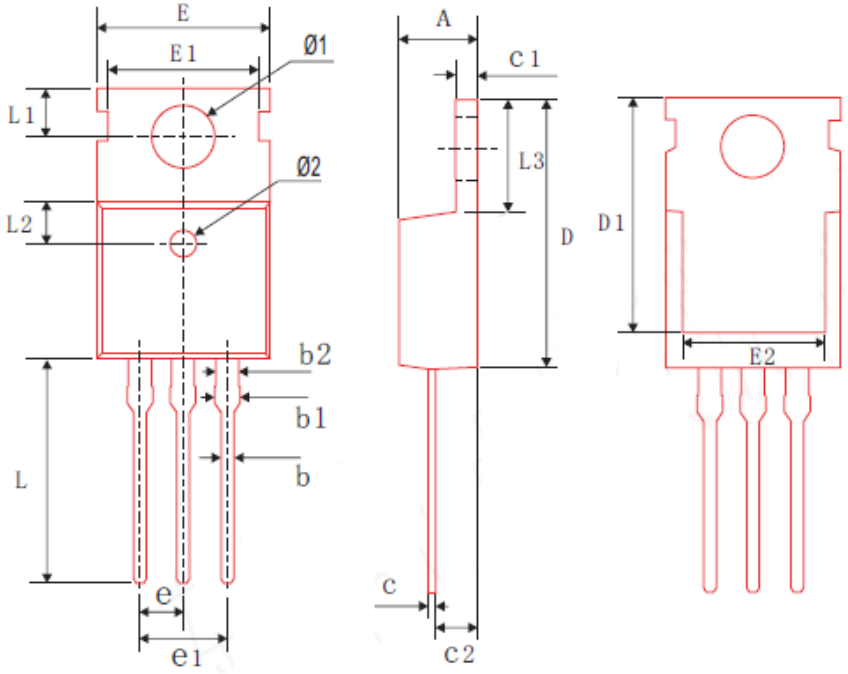
Package Dimensions

SOP-8



SYMBOM	MIN	NOM	MAX
A	1.40	1.60	1.80
A1	0.05	0.15	0.25
A2	1.35	1.45	1.55
b	0.30	0.40	0.50
c	0.153	0.203	0.253
D	4.80	4.90	5.00
E	3.80	3.90	4.00
E1	5.80	6.00	6.20
L	0.45	0.70	1.00
θ	2°	4°	6°
L1		1.04 REF	
e		1.27 BSC	
R1		0.07 TYP	
R2		0.07 TYP	

TO-220AB



SYMBOM	MIN	NOM	MAX
A	4.30	4.50	4.70
b	0.70	0.80	0.90
b1	--	--	1.42
b2	1.17	1.27	1.37
c	0.40	0.50	0.60
c1	1.25	1.30	1.35
c2	2.20	2.40	2.60
D	15.45	15.65	15.85
D1	13.20	13.40	13.60
E	9.80	10.0	10.2
E1	8.60	8.70	8.80
E2	7.80	8.00	8.20
e1	4.88	5.08	5.28
L	12.95	13.15	13.35
L1	2.70	2.80	2.90
L2	2.40	2.50	2.60
L3	6.30	6.50	6.70
θ1	3.50	3.60	3.70
θ2	1.35	1.50	1.65
e	2.54 BSC		

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