

## 150V N-Channel Enhancement Mode MOSFET

### General Features

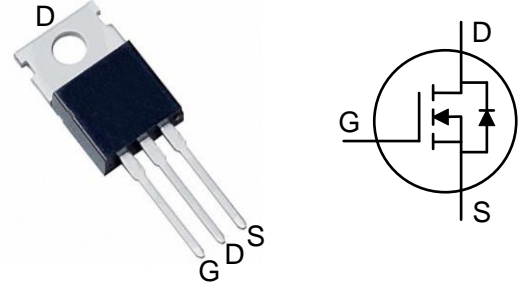
- Rugged Polysilicon Gate Cell Structure
- High Dense Cell Design for Extremely Low  $R_{DS(ON)}$ .
- RoHS Compliant
- Halogen-free Available

<b><math>BV_{DSX}</math></b>	<b><math>R_{DS(ON)}</math> (Typ.)</b>	<b><math>I_D</math></b>
<b>150V</b>	<b>80mΩ</b>	<b>17A</b>

**TO-220AB**

### Applications

- Amplifier Applications
- Logic Level Translator
- High Speed Line Driver
- Current Regulators
- Battery Charger Applications



### Ordering Information

Part Number	Package	Marking	Remark
FTP0P1N15G	TO-220AB	0P1N15	Halogen Free

### Absolute Maximum Ratings

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

Symbol	Parameter	FTP0P1N15G	Unit
$V_{DSX}$	Drain-to-Source Voltage <sup>[1]</sup>	150	V
$V_{DGX}$	Drain-to-Gate Voltage <sup>[1]</sup>	150	V
$I_D$	Continuous Drain Current	17	A
$I_{DM}$	Pulsed Drain Current <sup>[2]</sup>	51	
$P_D$	Power Dissipation	80	W
$V_{GS}$	Gate-to-Source Voltage	±20	V
$T_L$	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	FTP0P1N15G	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.56	°C/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	$V_{GS}=0V, I_D=250\mu A$
$I_{D(OFF)}$	Drain-to-Source Leakage Current	--	--	10	$\mu A$	$V_{DS}=150V, V_{GS}=0V$
$I_{GSS}$	Gate-to-Source Leakage Current	--	--	100	nA	$V_{GS}=20V, V_{DS}=0V$
		--	--	-100		$V_{GS}=-20V, V_{DS}=0V$

#### ON Characteristics

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

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	80	--	m $\Omega$	$V_{GS}=10V, I_D=10A$ <sup>[3]</sup>
$V_{GS(TH)}$	Gate Threshold Voltage	2.5	--	4.8	V	$V_{GD}=0V, I_D=50\mu A$
gfs	Forward Transconductance	--	14	--	S	$V_{DS}=5V, I_D=10A$

#### Dynamic Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$C_{iss}$	Input Capacitance	--	1169	--	pF	$V_{GS}=0V$ $V_{DS}=50V$ $f=1.0MHz$
$C_{oss}$	Output Capacitance	--	138	--		
$C_{rss}$	Reverse Transfer Capacitance	--	36	--		
$Q_g$	Total Gate Charge	--	36.5	--	nC	$V_{GS}=10V$ $V_{DS}=75V$ $I_D=10A$
$Q_{gs}$	Gate-to-Source Charge	--	7.7	--		
$Q_{gd}$	Gate-to-Drain (Miller) Charge	--	16.4	--		

#### Resistive Switching Characteristics

Essentially independent of operating temperature

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
$t_{d(on)}$	Turn-on Delay Time	--	14	--	ns	$V_{GS}=10V$ $V_{DD}=75V$ $I_D=10A$ $R_G=3.3\Omega$
$t_{rise}$	Rise Time	--	18	--		
$t_{d(off)}$	Turn-off Delay Time	--	29.6	--		
$t_{fall}$	Fall Time	--	20	--		



### 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	$I_{SD}=10\text{A}$ , $V_{GS}=0\text{V}$

#### NOTE:

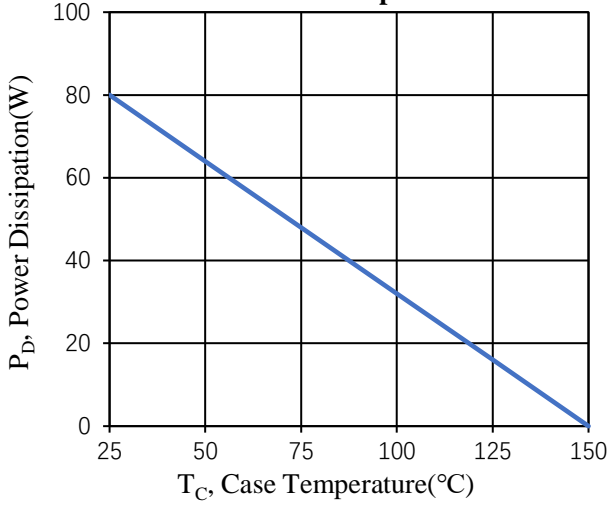
[1]  $T_j=+25^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$ .

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

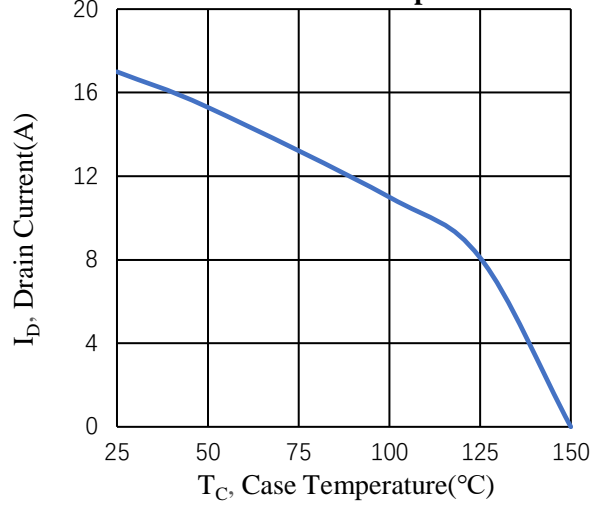
[3] Pulse width  $\leq 380\mu\text{s}$ , duty cycle  $\leq 2\%$ .

### Typical Characteristics

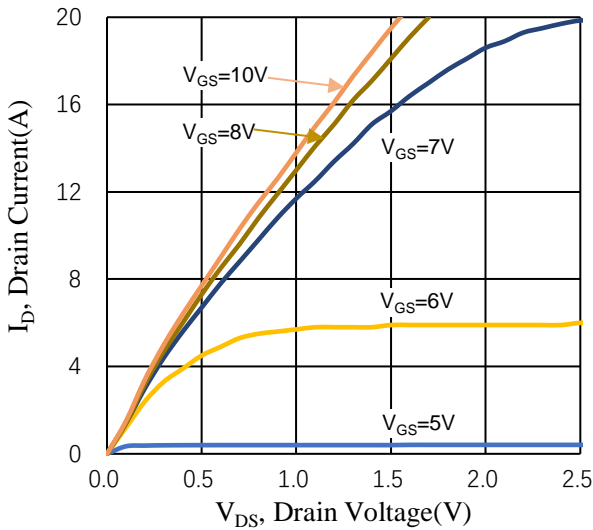
**Figure 1. Maximum Power Dissipation vs. Case Temperature**



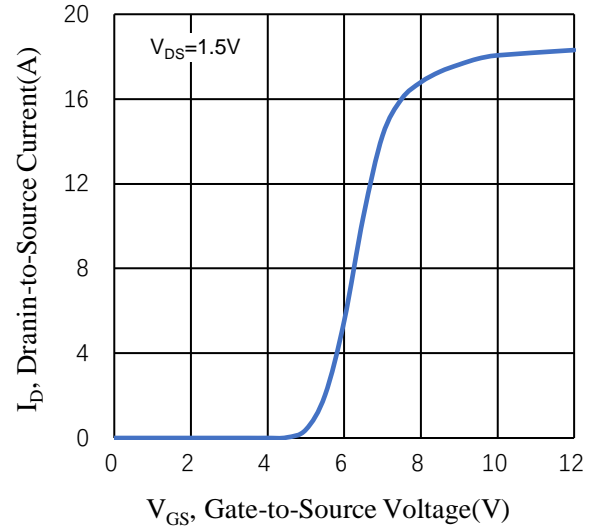
**Figure 2. Maximum Continuous Drain Current vs. Case Temperature**



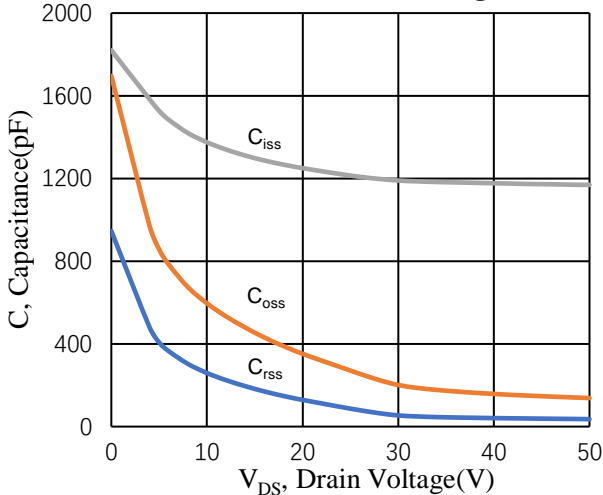
**Figure 3. Typical Output Characteristics**



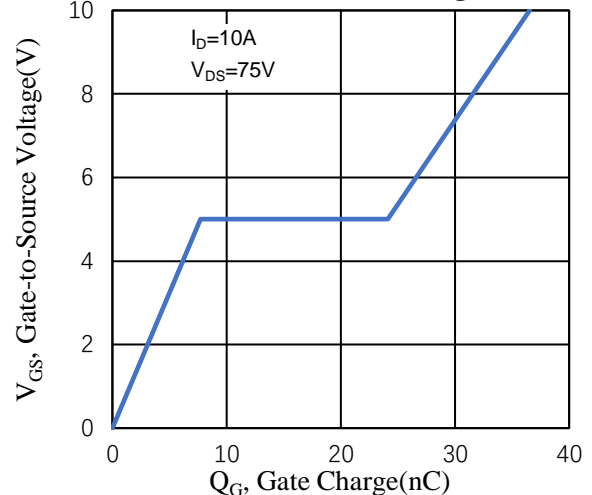
**Figure 4. Typical Transfer Characteristics**



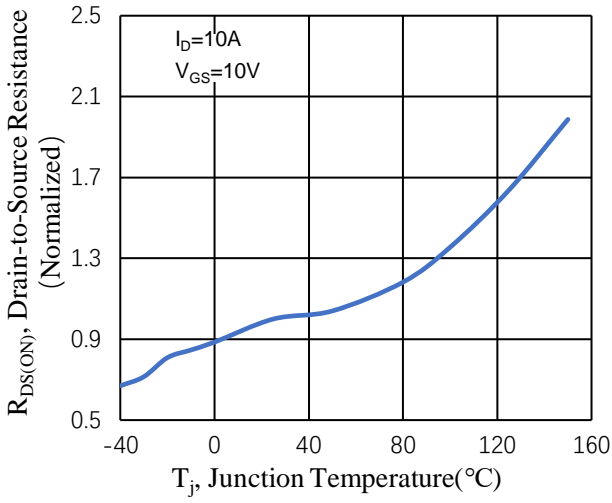
**Figure 5. Typical Capacitance vs. Drain-to-Source Voltage**



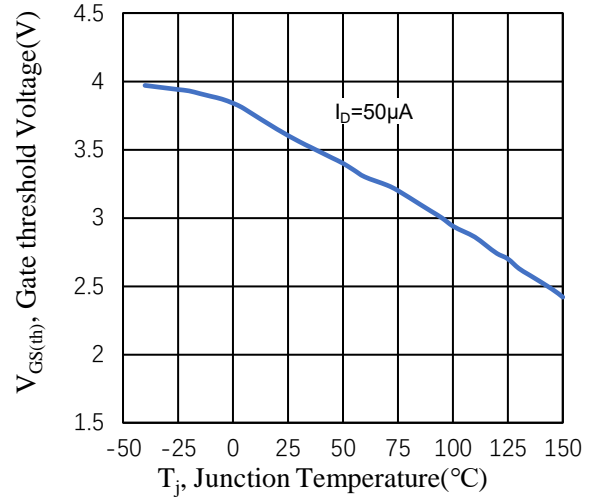
**Figure 6. Typical Gate Charge vs. Gate-to-Source Voltage**



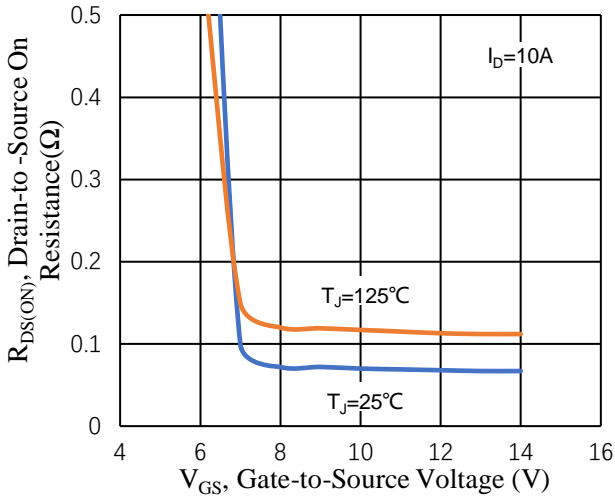
**Figure 7. Normalized On-Resistance vs. Temperature**



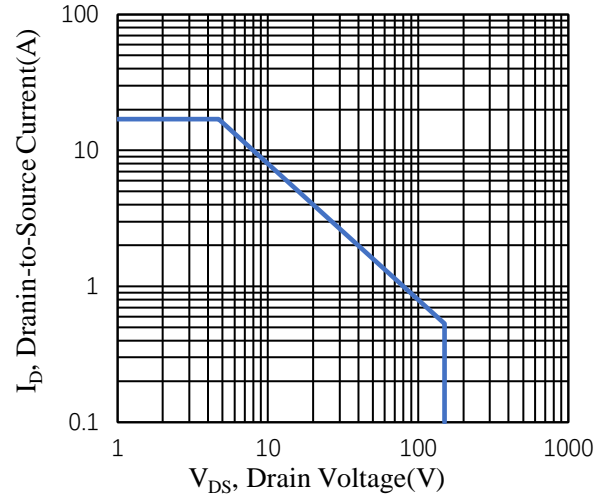
**Figure 8. Threshold Voltage vs. Temperature**

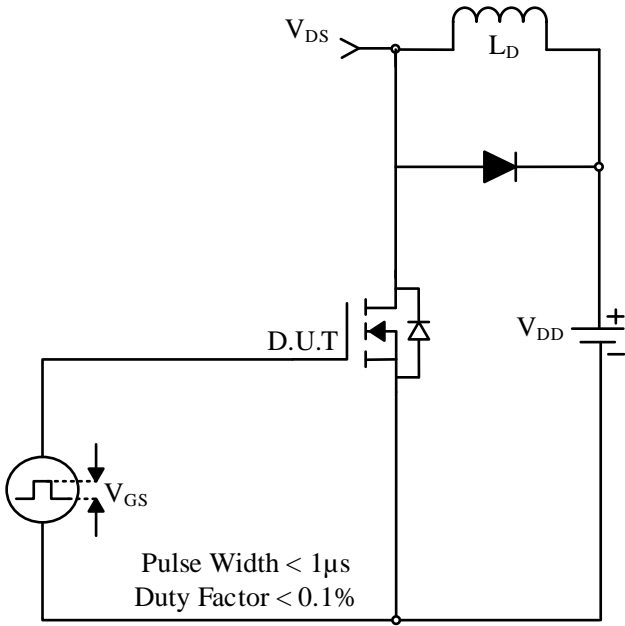


**Figure 9. On-Resistance Vs. Gate Voltage**

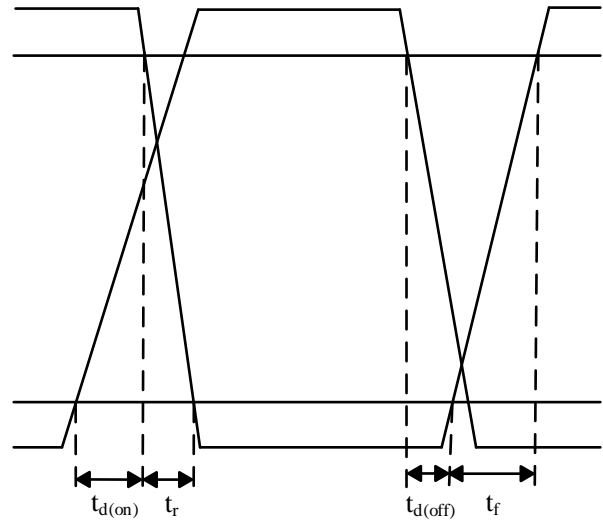


**Figure 10. Maximum Forward Safe Operating Area**





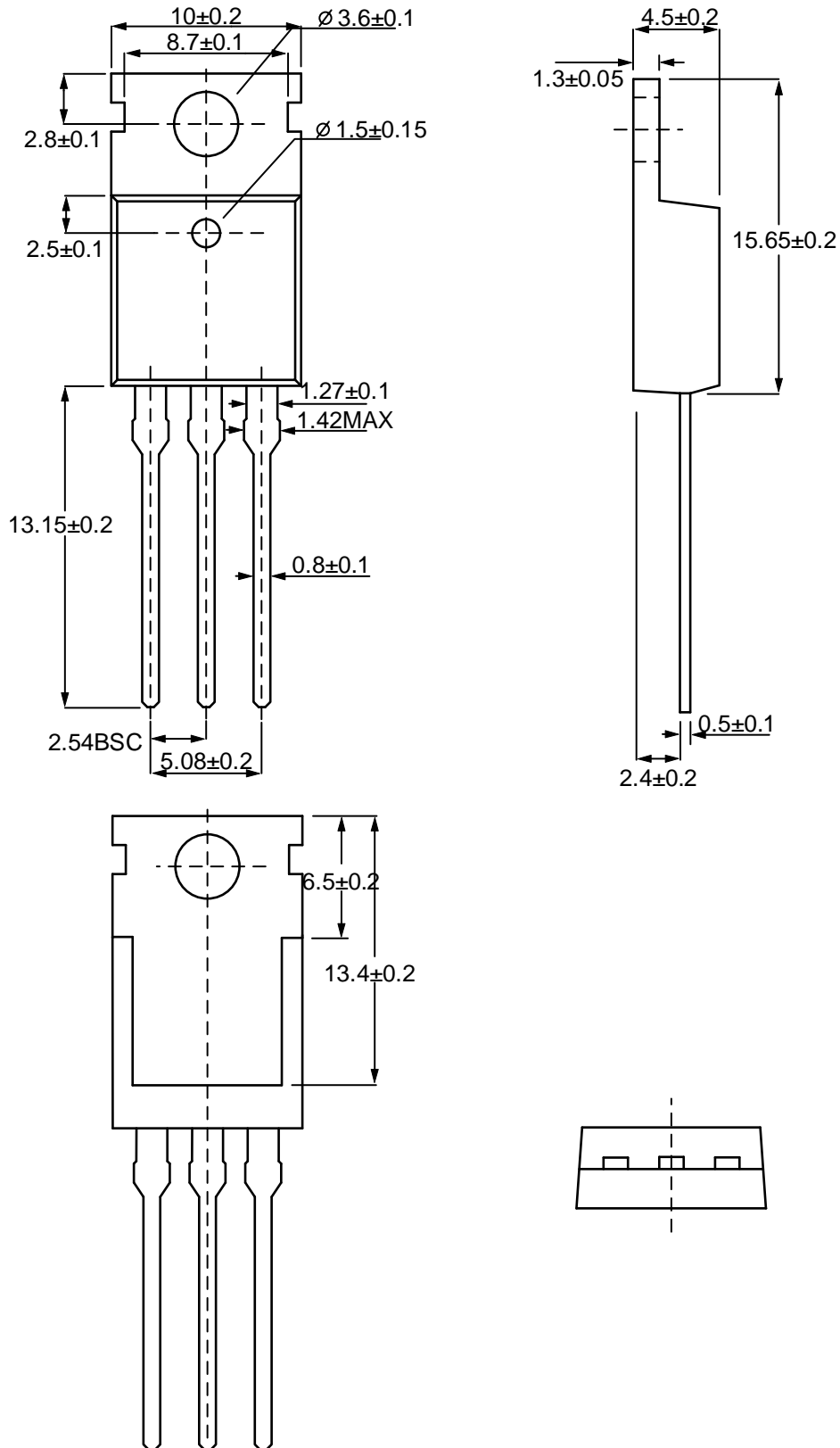
**Figure 11a. Switching Time Test Circuit**



**Figure 11b. Switching Time Waveforms**

Package Dimensions

TO-220AB





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