

## 40V N-Channel Enhancement Mode MOSFET

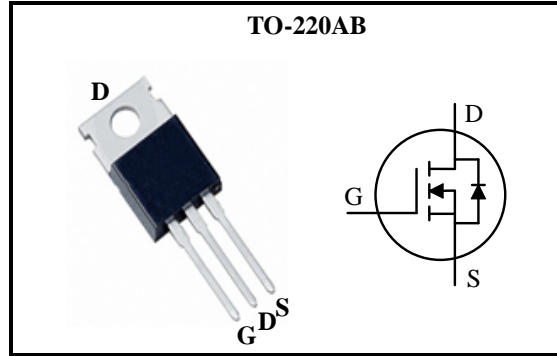
### General Features

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

$BV_{DSX}$	$R_{DS(ON)}$ (Typ.)	$I_D$
<b>40V</b>	<b>1.3mΩ</b>	<b>347A</b>

### Applications

- Audio Amplifier Applications
- High Speed Switch
- Load Switch
- Motor Driver



### Ordering Information

Part Number	Package	Marking	Remark
FTP40N1P5L	TO-220AB	40N1P5L	Halogen Free

### Absolute Maximum Ratings

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

Symbol	Parameter	FTP40N1P5L	Unit
$V_{DSX}$	Drain-to-Source Voltage <sup>[1]</sup>	40	V
$V_{DGX}$	Drain-to-Gate Voltage <sup>[1]</sup>	40	V
$I_D$	Continuous Drain Current	347	A
$I_{DM}$	Pulsed Drain Current <sup>[2]</sup>	500	
$P_D$	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	FTP40N1P5L	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	40	--	--	V	$V_{GS}=0V, I_D=250\mu A$
$I_{DSS}$	Drain-to-Source Leakage Current	--	--	10	$\mu A$	$V_{DS}=40V, V_{GS}=0V$
$I_{GSS}$	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	--	1.3	1.5	m $\Omega$	$V_{GS}=10V, I_D=10A$ <sup>[3]</sup>
$V_{GS(TH)}$	Gate Threshold Voltage	1.0	--	3.0	V	$V_{GD}=0V, I_D=50\mu A$
gfs	Forward Transconductance	--	--	--	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	--	--	--	pF	$V_{GS}=0V$ $V_{DS}=25V$ $f=1.0MHz$
$C_{oss}$	Output Capacitance	--	--	--		
$C_{rss}$	Reverse Transfer Capacitance	--	--	--		
$Q_g$	Total Gate Charge	--	--	--	nC	$V_{GS}=10V$ $V_{DS}=20V$ $I_D=10A$
$Q_{gs}$	Gate-to-Source Charge	--	--	--		
$Q_{gd}$	Gate-to-Drain (Miller) Charge	--	--	--		

#### Resistive Switching Characteristics

Essentially independent of operating temperature

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



**Source-Drain Diode Characteristics**

T<sub>A</sub>=25°C unless otherwise specified

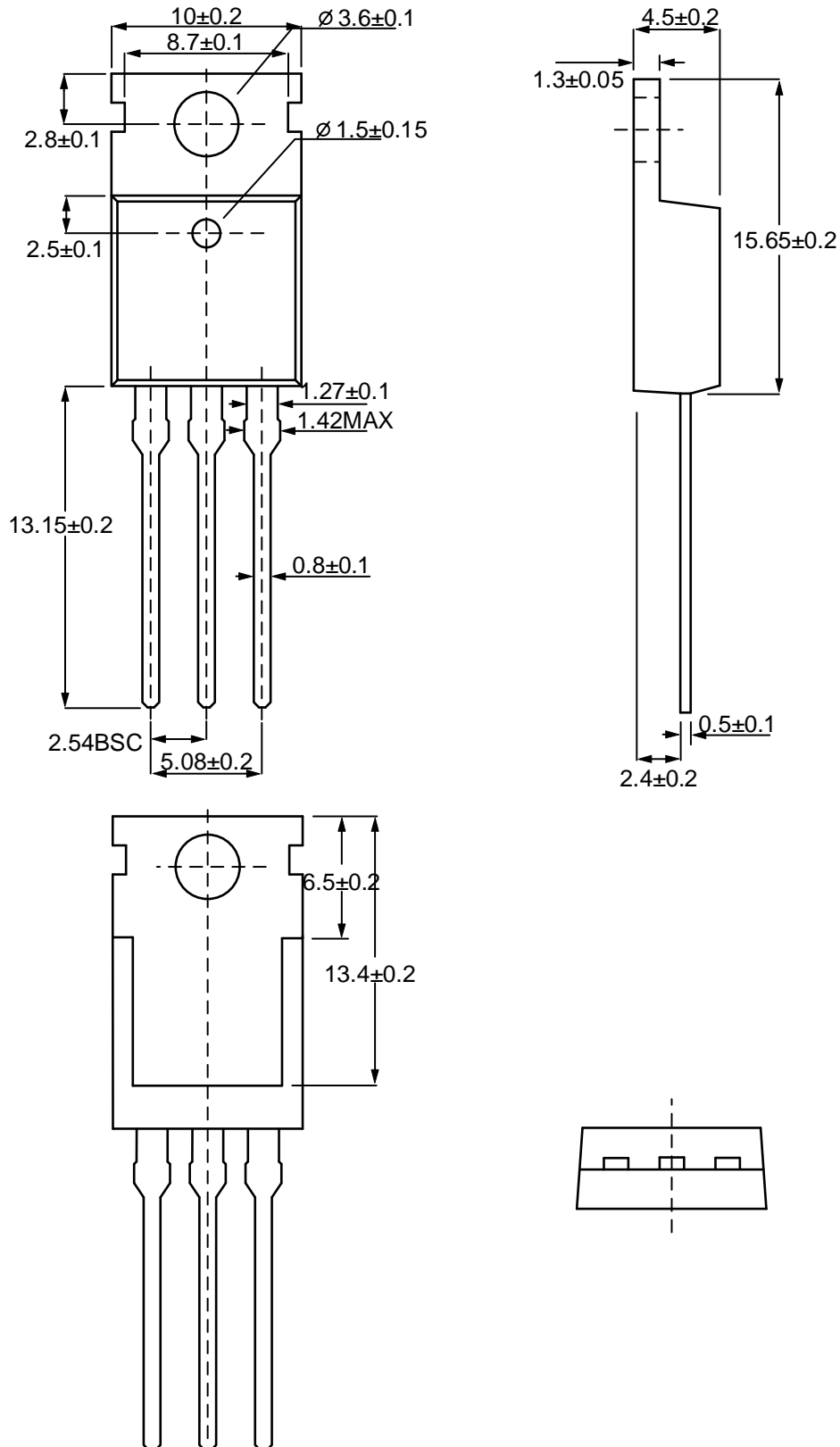
Symbol	Parameter	Min	Typ.	Max.	Unit	Test Conditions
V <sub>SD</sub>	Diode Forward Voltage	--	--	1.5	V	I <sub>SD</sub> =10A, V <sub>GS</sub> =0V

**NOTE:**

- [1] T<sub>j</sub>=+25°C to +150°C.
- [2] Repetitive rating, pulse width limited by maximum junction temperature.
- [3] Pulse width≤380μs, duty cycle≤2%.

Package Dimensions

TO-220AB





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