



# Bay Linear

Inspire the Linear Power

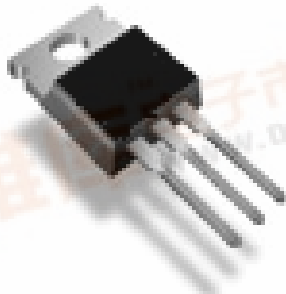
## N-Channel Field Effect Transistor

## 4N600(3600)

### Description

The Bay Linear n-channel power field effect transistors are produced using high cell density DMOS technology. These devices are particularly suited for high voltage applications such as automotive and other battery powered circuits where fast switching, low in-line power loss and resistance to transistors are needed.

The TO-220 is offered in a 3-pin is universally preferred for all commercial-industrial applications at power dissipation level to approximately 50 watts. Also, available in a D<sup>2</sup> surface mount power package with a power dissipation up to 2 Watts



### Features

- **Critical DC Electrical parameters specified at elevated Temp.**
- **Rugged internal source-drain diode can eliminate the need for external Zener diode transient suppressor**
- **Super high density cell design for extremely low R<sub>DS(ON)</sub>**

$$V_{DS} = 600V$$

$$R_{DS(ON)} = 1.9 \Omega$$

$$I_D = 4.0A$$

### Ordering Information

Device	Package	Temp.
4N600T	TO-220	0 to 150°C
4N600S	TO-263 (D <sup>2</sup> )	0 to 150°C

### Absolute Maximum Rating

Symbol	Parameter	Max	Unit
$I_D$ (T <sub>C</sub> =25°C)	Drain Current	4.0	A
$I_D$ (T <sub>C</sub> =100°C)	-Continues	2.5	
	-Pulsed	16	
V <sub>GSV</sub>	Gate Source Voltage	±20	V
P <sub>D</sub>	Total Power Dissipation @ T <sub>C</sub> =25°C	75	W
	Derate above 25°C	0.59	W/°C
T <sub>J</sub>	Operating and Storage	-55 to 150	°C
T <sub>STG</sub>	Temperature Range		

## Electrical Characteristics ( $T_C = 25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=600\text{V}$ $V_{GS}=0\text{V}$			100	$\mu\text{A}$
$V$	Drain-to-Source Breakdown	$I_D=100\mu\text{A}$ , $V_{GS}=0$	600	-	-	$\text{V}$
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$ $I_D=250\mu\text{A}$	2		4	$\text{V}$
$R_{DS(ON)}$	Static Drain Voltage	$V_{GS}=10\text{V}$ , $I_D=2.4\text{A}$	-	-	1.9	$\Omega$
$I_{GSS}$	Gate-to-Source Forward Leakage Gate-to-Source Reverse Leakage	$V_{GS}=20\text{V}$ $V_{GS}=-20\text{V}$			100 -100	$\text{NA}$
$g_{fs}$	Forward Transconductance	$V_{DS}=100\text{V}$ , $I_D=2.4\text{A}$	2.9			$\text{S}$
$C_{ISS}$	Input Capacitance	$V_{DS}=25\text{V}$ , $V_{GS}=0\text{V}$ $F=1.0\text{ MHz}$		800		$\text{pF}$
$C_{OSS}$	Output Capacitance			110		$\text{pF}$
$C_{RSS}$	Reverse Tras. Capacitance			20		$\text{pF}$
$t_{D(ON)}$	Turn-ON Delay Time	$V_{DD}=300\text{V}$ $I_D=2.4\text{A}$ , $R_{GEN}=12\Omega$ $R_D=74\Omega$		12		$\text{NS}$
$t_r$	Turn-ON Rise Time			18		
$t_{d(off)}$	Turn-OFF Delay Time			53		
$t_f$	Turn-OFF Fall Time			19		
$I_S$	Maxim Continuous Drain source Diode Forward Current				4.0	$\text{A}$
$V_{DS}(\text{note})$	Drain Source Diode Forward Voltage	$V_{GS}=0\text{V}$ $I_S=4\text{A}$			1.50	$\text{V}$
<b>THERMAL CHARACTERISTICS</b>						
$R_{JC}$	Thermal Resistance, Junction to Case				5	$^{\circ}\text{C/W}$
$R_{JA}$	Thermal Resistance, Junction to Ambient				100	$^{\circ}\text{C/W}$

Note: Pulse Test: Pulse Width  $\leq 300 \mu\text{S}$ , Duty Cycle  $\leq 2.0\%$

**Advance Information-** These data sheets contain descriptions of products that are in development. The specifications are based on the engineering calculations, computer simulations and/ or initial prototype evaluation.

**Preliminary Information-** These data sheets contain minimum and maximum specifications that are based on the initial device characterizations. These limits are subject to change upon the completion of the full characterization over the specified temperature and supply voltage ranges.

The application circuit examples are only to explain the representative applications of the devices and are not intended to guarantee any circuit design or permit any industrial property right to other rights to execute. Bay Linear takes no responsibility for any problems related to any industrial property right resulting from the use of the contents shown in the data book. Typical parameters can and do vary in different applications. Customer's technical experts must validate all operating parameters including "Typical" for each customer application.

## LIFE SUPPORT AND NUCLEAR POLICY

Bay Linear products are not authorized for and should not be used within life support systems which are intended for surgical implants into the body to support or sustain life, in aircraft, space equipment, submarine, or nuclear facility applications without the specific written consent of Bay Linear President.