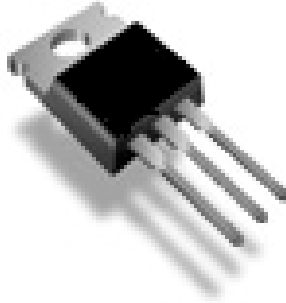




### Description

The Bay Linear n-channel power field effect transistors are produced using high cell density DMOS technology , These devices are particularly suited for low 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 to 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 suppresser**
- **Super high density cell design for extremely low R<sub>DS(ON)</sub>**

$$V_{DSS} = 30V$$

$$R_{DS(ON)} = 0.045 \Omega$$

$$I_D = 12A$$

### Ordering Information

Device	Package	Temp.
12N035T	TO-220	0 to 150°C
12N035S	TO-263 ( D <sup>2</sup> )	0 to 150°C

### Absolute Maximum Rating

Symbol	Parameter	Max	Unit
I <sub>D</sub>	Drain Current		
	-Continues	12	A
	-Pulsed	36	
V <sub>DSS</sub>	Drain-Source Voltage	30	V
V <sub>GSV</sub>	Gate Source Voltage	±20	V
P <sub>D</sub>	Total Power Dissipation @ T <sub>C</sub> =25°C	50	W
	Derate above 25°C	0.4	W/°C
T <sub>J</sub>	Operating and Storage	-65 to 175	°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
<b>OFF CHARACTERISTICS</b>						
$BV_{DSS}$	Drain source breakdown voltage	$V_{GS}=0V, I_D=250\mu A$	30			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=24V$ $V_{GS}=0V$			10	$\mu A$
$I_{GBLF}$	Gate-Body Leakage Forward	$V_{GS}=20V, V_{DS}=0V$			100	nA
$I_{GBLR}$	Gate-Body Leakage Reverse	$V_{GS}=-20V, V_{DS}=0V$			-100	nA
<b>ON CHARACTERISTICS</b>						
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$ $I_D=250\mu A$	1		3	V
$R_{DS(ON)}$	Static Drain Voltage	$V_{GS}=10V, I_D=26A$ $V_{CS}=4.5V, I_O=21A$			0.045 0.06	$\Omega$
$I_{D(ON)}$	ON-State Drain Current	$V_{GS}=10V$	12			A
$g_s$	Forward Transconductance	$V_{DS}=10V, I_D=6A$		9		S
<b>DYNAMIC CHARACTERISTICS</b>						
$C_{ISS}$	Input Capacitance	$V_{DS}=10V, V_{GS}=0V$ $F=1.0\text{ MHz}$			550	pF
$C_{OSS}$	Output Capacitance				300	pF
$C_{RSS}$	Reverse Tras. Capacitance				150	pF
<b>SWITCHING CHARACTERISTICS</b>						
$t_{D(ON)}$	Turn-ON Delay Time	$V_{DD}=10V$ $I_D=12A, V_{DS}=10V$ $R_{GEN}=24\Omega$			16	nS
$t_r$	Turn-ON Rise Time				250	
$t_{d(off)}$	Turn-OFF Delay Time				90	
$t_f$	Turn-OFF Fall Time				200	
<b>SOURCE DRAIN DIODE CHARACTERISTICS</b>						
$I_S$	Maxim Continuous Drain source Diode Forward Current				12	A
$V_{DS}(\text{note})$	Drain Source Diode Forward Voltage	$V_{GS}=0V$ $I_S=6A$			1.30	V
<b>THERMAL CHARACTERISTICS</b>						
$R_{JC}$	Thermal Resistance, Junction to Case				5	$^\circ\text{C/W}$
$R_{JC}$	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.

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