



BFL4036

N-Channel Power MOSFET 500V, 14A, 0.52Ω, TO-220F-3FS

ON Semiconductor®

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Features

- ON-resistance $R_{DS(on)}=0.4\Omega$ (typ.)
- Input capacitance $C_{iss}=1000\text{pF}$ (typ.)
- 10V drive

Specifications

Absolute Maximum Ratings at $T_a=25^\circ\text{C}$

| Parameter | Symbol | Conditions | Ratings | Unit |
|------------------------------------|------------------|-----------------------------------------------------------------|-------------|------------------|
| Drain to Source Voltage | V_{DSS} | | 500 | V |
| Gate to Source Voltage | V_{GSS} | | ± 30 | V |
| Drain Current (DC) | I_{DC}^{*1} | Limited only by maximum temperature $T_{ch}=150^\circ\text{C}$ | 14 | A |
| | I_{Dpack}^{*2} | $T_c=25^\circ\text{C}$ (Our ideal heat dissipation condition)*3 | 9.6 | A |
| Drain Current (Pulse) | I_{DP} | $PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$ | 50 | A |
| Allowable Power Dissipation | PD | | 2.0 | W |
| | | $T_c=25^\circ\text{C}$ (Our ideal heat dissipation condition)*3 | 37 | W |
| Channel Temperature | T_{ch} | | 150 | $^\circ\text{C}$ |
| Storage Temperature | T_{stg} | | -55 to +150 | $^\circ\text{C}$ |
| Avalanche Energy (Single Pulse) *4 | EAS | | 109 | mJ |
| Avalanche Current *5 | I_{AV} | | 14 | A |

Note : *1 Shows chip capability

*2 Package limited

*3 Our condition is radiation from backside.

The method is applying silicone grease to the backside of the device and attaching the device to water-cooled radiator made of aluminium.

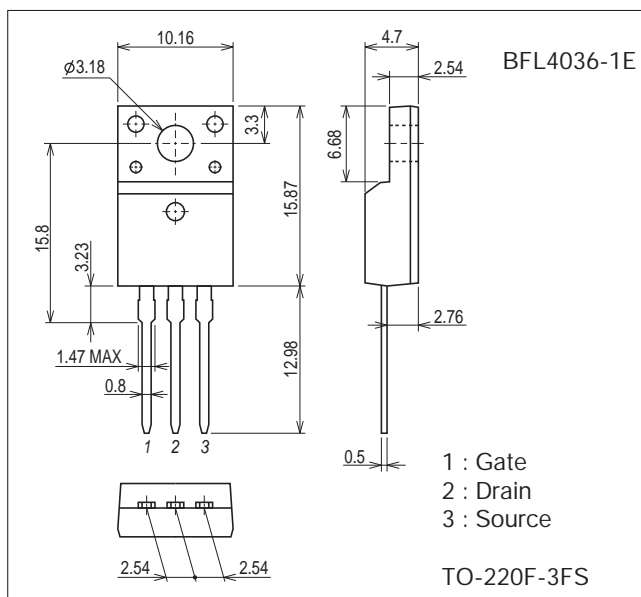
*4 $V_{DD}=50\text{V}$, $L=1\text{mH}$, $I_{AV}=14\text{A}$ (Fig.1)*5 $L \leq 1\text{mH}$, single pulse

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Package Dimensions

unit : mm (typ)

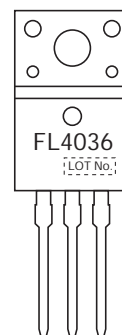
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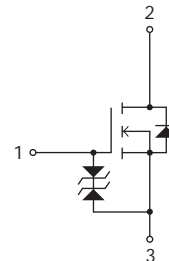
Ordering & Package Information

| Device | Package | Shipping | memo |
|------------|----------------------|-----------------|---------|
| BFL4036-1E | TO-220F-3FS SC-67 | 50 pcs./tube | Pb-Free |

Marking



Electrical Connection



Electrical Characteristics at Ta=25°C

| Parameter | Symbol | Conditions | Ratings | | | Unit | |
|--------------------------------------------|----------|-------------------------------|---------|------|------|------|----|
| | | | min | typ | max | | |
| Drain to Source Breakdown Voltage | V(BR)DSS | ID=10mA, VGS=0V | 500 | | | V | |
| Zero-Gate Voltage Drain Current | IDSS | VDS=400V, VGS=0V | | | 100 | μA | |
| Gate to Source Leakage Current | IGSS | VGS=±24V, VDS=0V | | | ±10 | μA | |
| Cutoff Voltage | VGS(off) | VDS=10V, ID=1mA | 3 | | 5 | V | |
| Forward Transfer Admittance | yfs | VDS=10V, ID=7A | 3.5 | 7 | | S | |
| Static Drain to Source On-State Resistance | RDS(on) | ID=7A, VGS=10V | | 0.4 | 0.52 | Ω | |
| Input Capacitance | Ciss | VDS=30V, f=1MHz | | 1000 | | pF | |
| Output Capacitance | Coss | | | | 200 | | pF |
| Reverse Transfer Capacitance | Crss | | | | 44 | | pF |
| Turn-ON Delay Time | td(on) | See Fig.2 | | 22 | | ns | |
| Rise Time | tr | | | | 66 | | ns |
| Turn-OFF Delay Time | td(off) | | | | 117 | | ns |
| Fall Time | tf | | | | 46 | | ns |
| Total Gate Charge | Qg | VDS=200V, VGS=10V, ID=14A | | 38.4 | | nC | |
| Gate to Source Charge | Qgs | | | | 6.7 | | nC |
| Gate to Drain "Miller" Charge | Qgd | | | | 22.1 | | nC |
| Diode Forward Voltage | VSD | IS=14A, VGS=0V | | 0.95 | 1.3 | V | |
| Reverse Recovery Time | trr | See Fig.3 | | 520 | | ns | |
| Reverse Recovery Charge | Qrr | IS=14A, VGS=0V, di/dt=100A/μs | | 4200 | | nC | |

Fig.1 Unclamped Inductive Switching Test Circuit

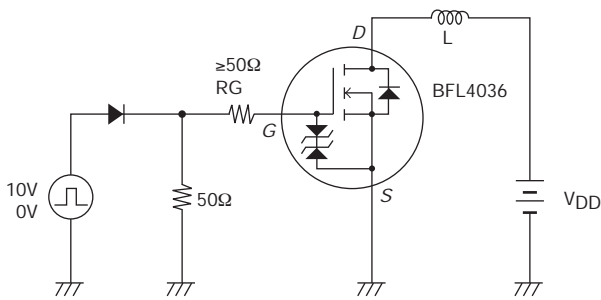


Fig.2 Switching Time Test Circuit

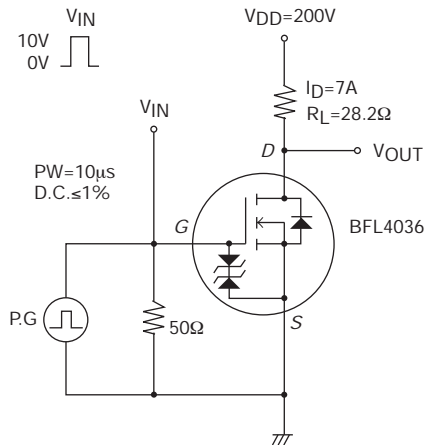
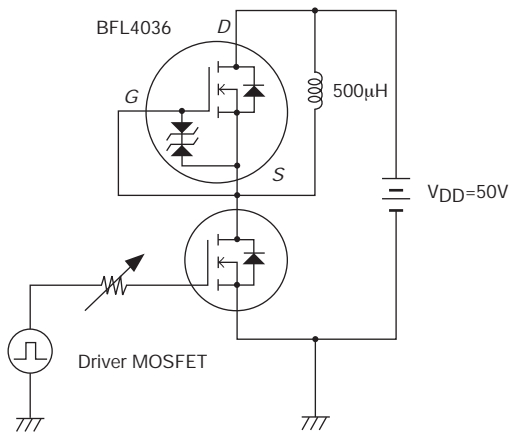
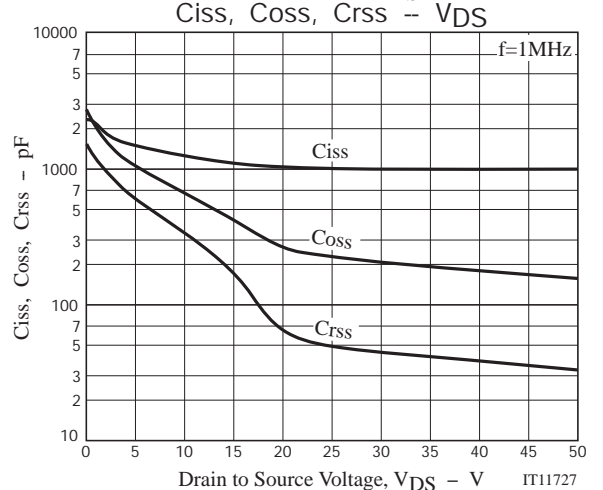
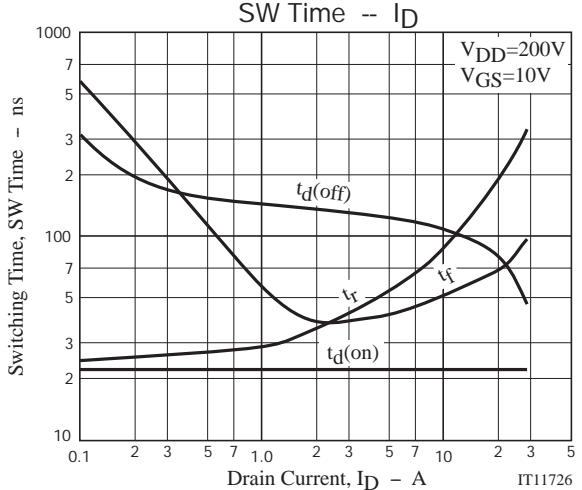
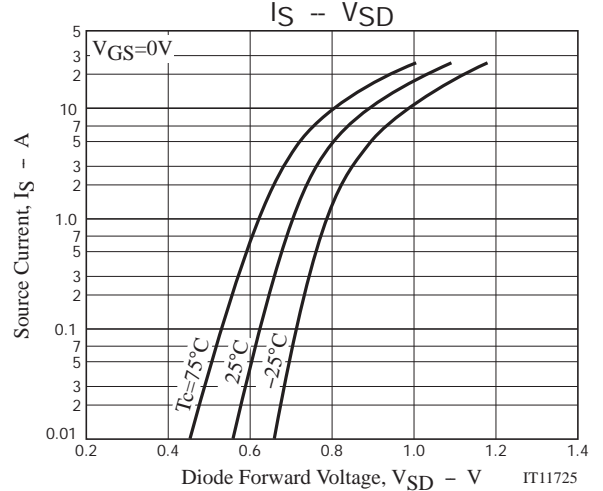
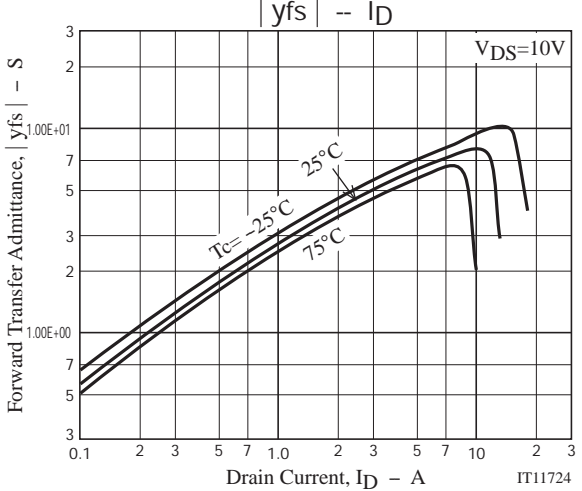
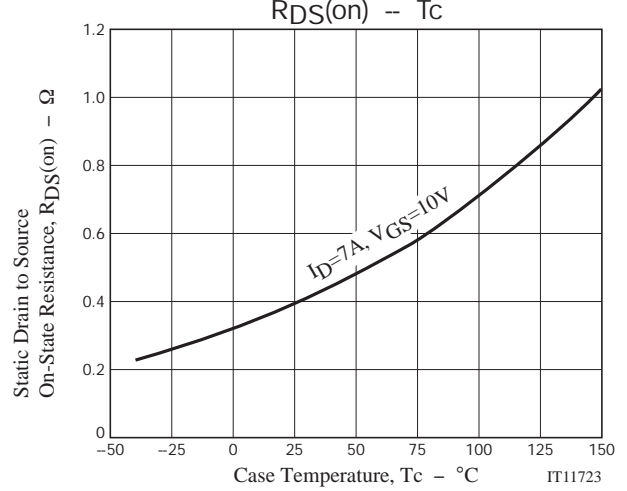
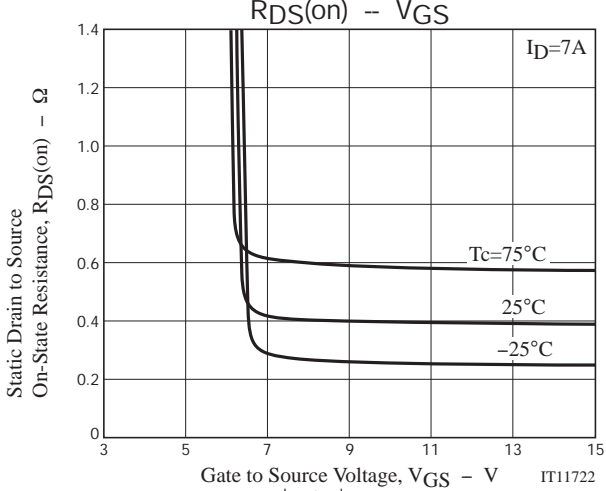
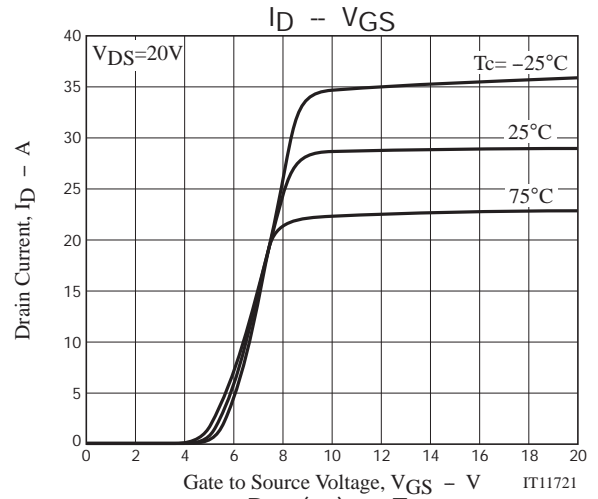
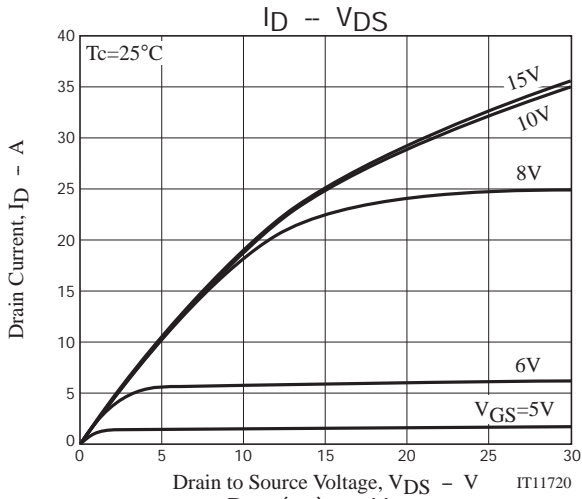
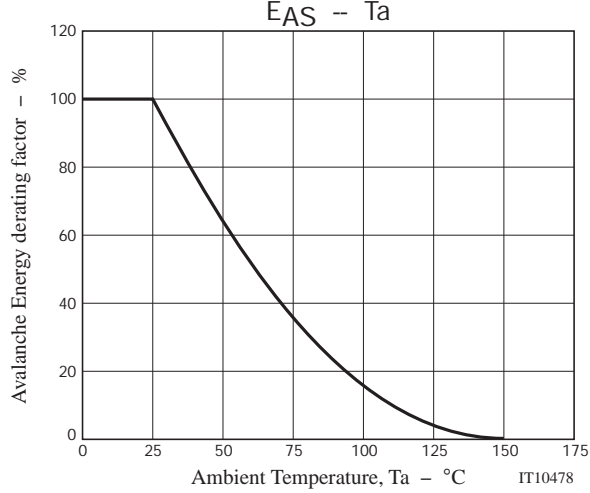
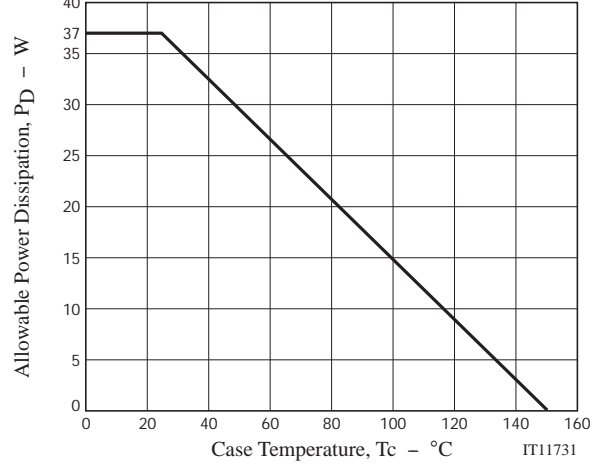
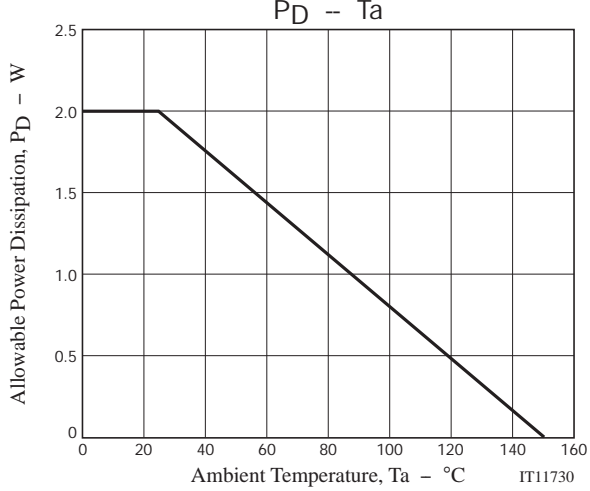
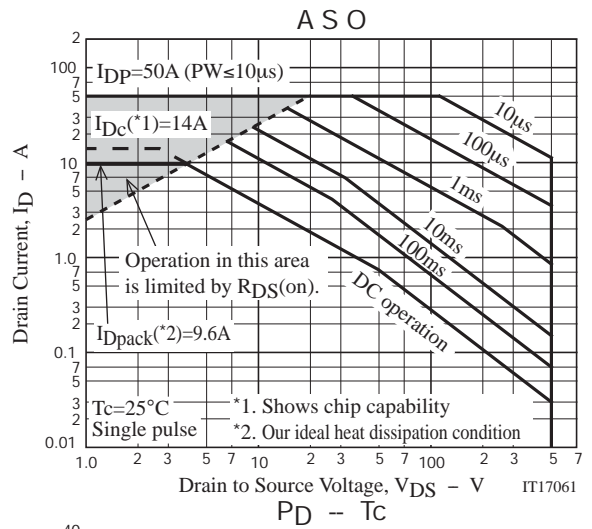
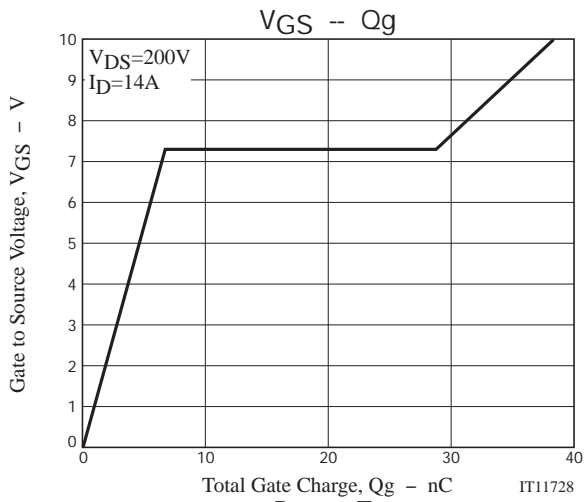


Fig.3 Reverse Recovery Time Test Circuit

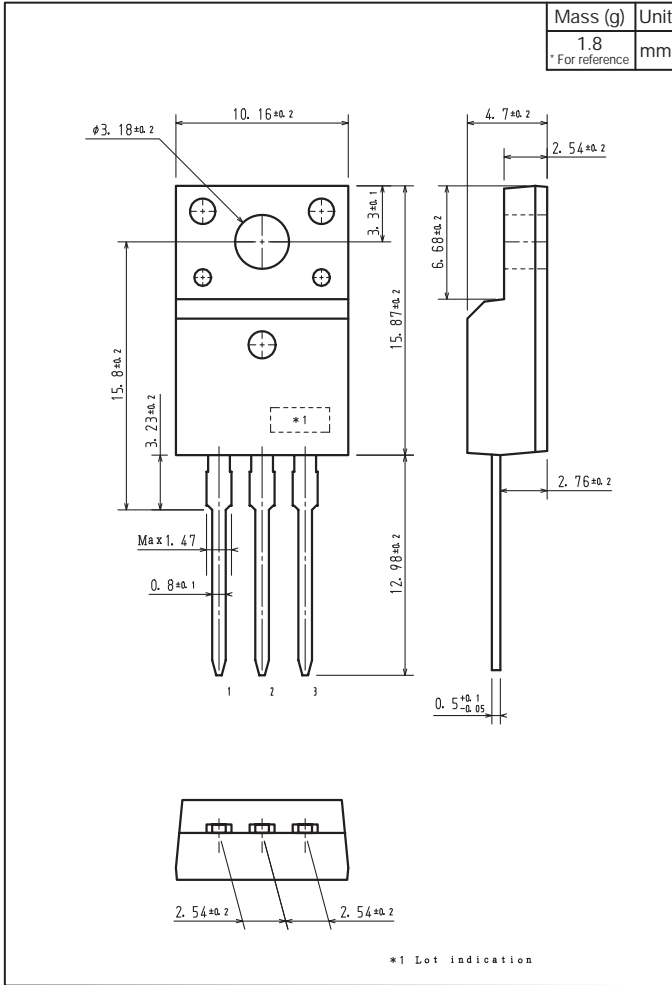






Outline Drawing

BFL4036-1E



Note on usage : Since the BFL4036 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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