



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFET

BFL4004 — General-Purpose Switching Device Applications

Features

- ON-resistance $R_{DS(on)}=1.9\Omega$ (typ.)
- Input capacitance $C_{iss}=710\text{pF}$ (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}		800	V
Gate-to-Source Voltage	V_{GSS}		± 30	V
Drain Current (DC)	I_{Dc}^{*1}	Limited only by maximum temperature $T_{ch}=150^\circ\text{C}$	6.5	A
	I_{Dpack}^{*2}	$T_c=25^\circ\text{C}$ (SANYO's ideal heat dissipation condition)*3	4.3	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	13	A
Allowable Power Dissipation	P_D		2.0	W
		$T_c=25^\circ\text{C}$ (SANYO's ideal heat dissipation condition)*3	36	W
Channel Temperature	T_{ch}		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$
Avalanche Energy (Single Pulse) *4	E_{AS}		241	mJ
Avalanche Current *5	I_{AV}		6.5	A

Note : *1 Shows chip capability

*2 Package limited

*3 SANYO's condition is radiation from backside.

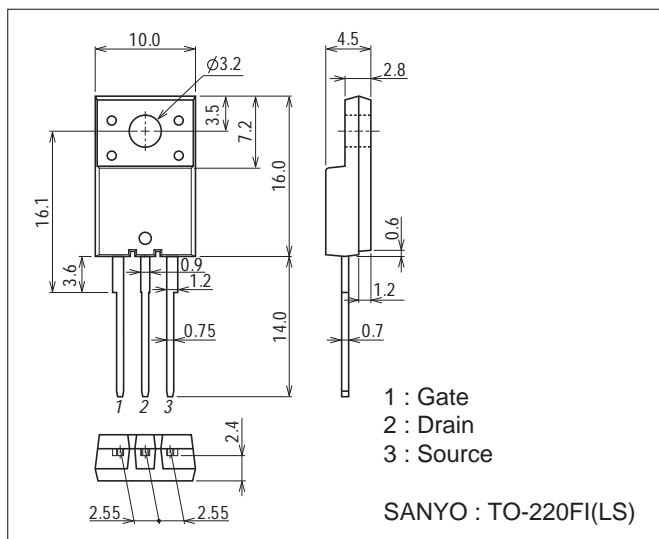
The method is applying silicone grease to the backside of the device and attaching the device to water-cooled radiator made of aluminium.

*4 $V_{DD}=99\text{V}$, $L=10\text{mH}$, $I_{AV}=6.5\text{A}$ (Fig.1)*5 $L \leq 10\text{mH}$, single pulse

Package Dimensions

unit : mm (typ)

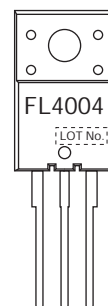
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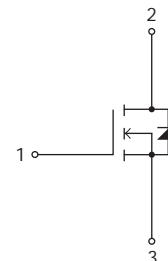
Product & Package Information

- Package : TO-220FI(LS)
- JEITA, JEDEC : SC-67, SOT-186A, TO-220F
- Minimum Packing Quantity : 100 pcs./bag or 50pcs./magazine

Marking



Electrical Connection



SANYO Semiconductor Co., Ltd.

<http://semicon.sanyo.com/en/network>

BFL4004

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=10mA, V_{GS}=0V$	800			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=640V, V_{GS}=0V$			1.0	mA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$			± 100	nA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	2.0		4.0	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=20V, I_D=3.25A$	1.7	3.4		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	$I_D=3.25A, V_{GS}=10V$		1.9	2.5	Ω
Input Capacitance	C_{iss}	$V_{DS}=30V, f=1MHz$		710		pF
Output Capacitance	C_{oss}	$V_{DS}=30V, f=1MHz$		120		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=30V, f=1MHz$		42		pF
Turn-ON Delay Time	$t_{d(on)}$	See Fig.2		17		ns
Rise Time	t_r	See Fig.2		44		ns
Turn-OFF Delay Time	$t_{d(off)}$	See Fig.2		130		ns
Fall Time	t_f	See Fig.2		44		ns
Total Gate Charge	Q_g	$V_{DS}=200V, V_{GS}=10V, I_D=6.5A$		36		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=200V, V_{GS}=10V, I_D=6.5A$		6.2		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=200V, V_{GS}=10V, I_D=6.5A$		18		nC
Diode Forward Voltage	V_{SD}	$I_S=6.5A, V_{GS}=0V$		0.85	1.2	V
Reverse Recovery Time	t_{rr}	See Fig.3		780		ns
Reverse Recovery Charge	Q_{rr}	$I_S=6.5A, V_{GS}=0V, di/dt=100A/\mu s$		5400		nC

Fig.1 Avalanche Resistance Test Circuit

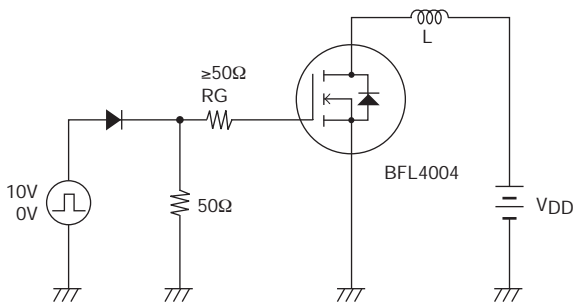


Fig.2 Switching Time Test Circuit

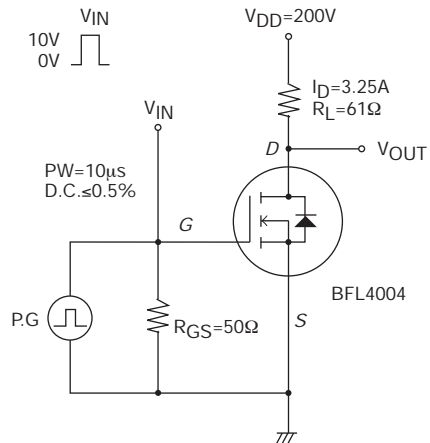
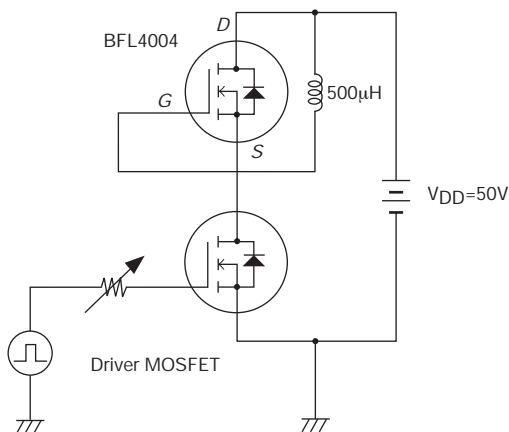
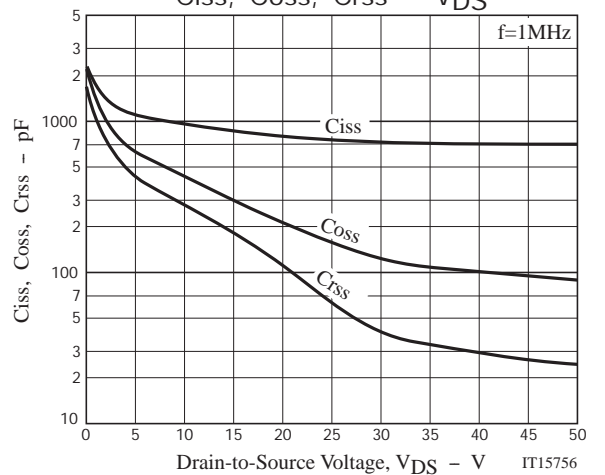
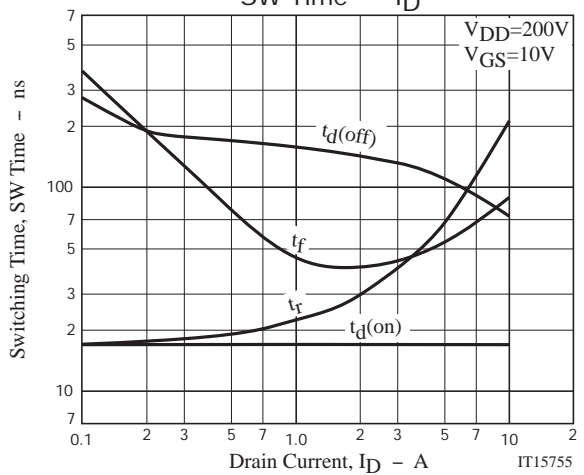
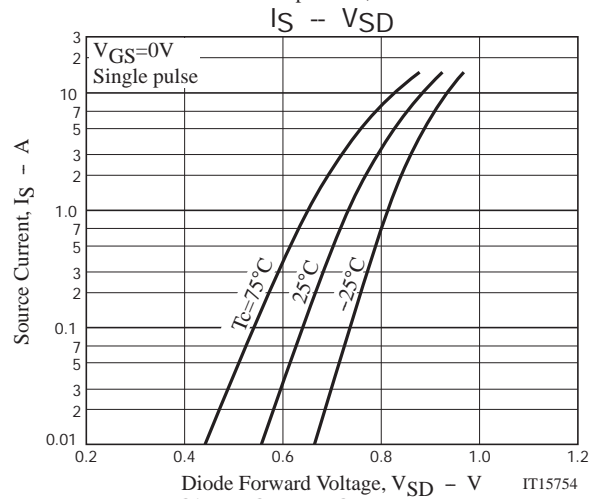
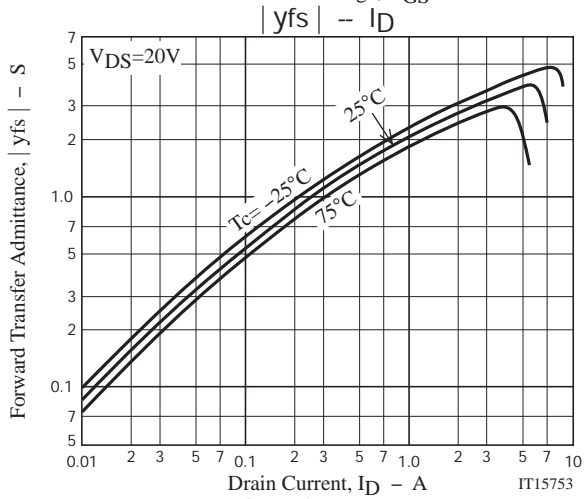
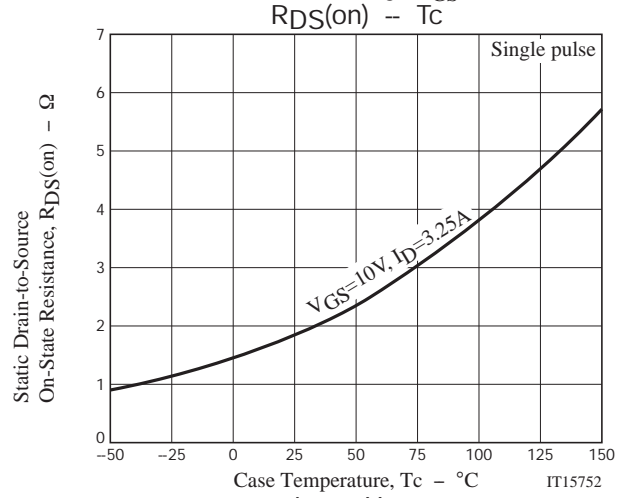
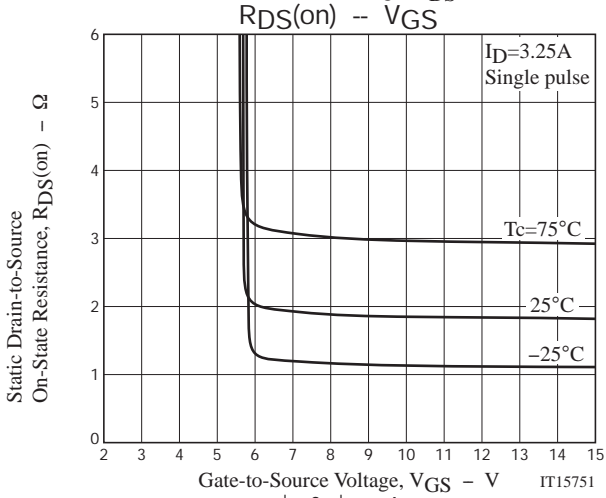
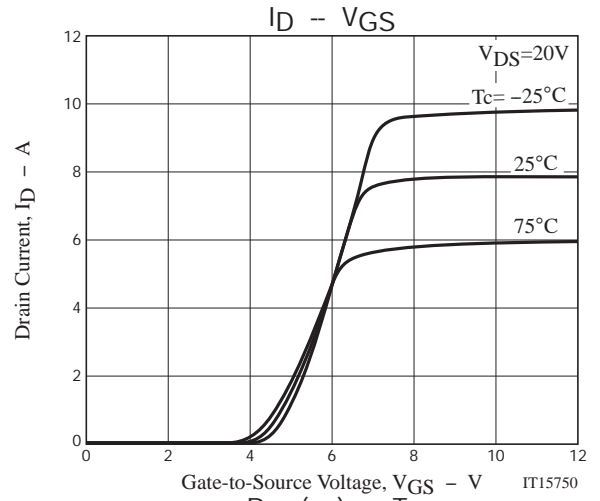
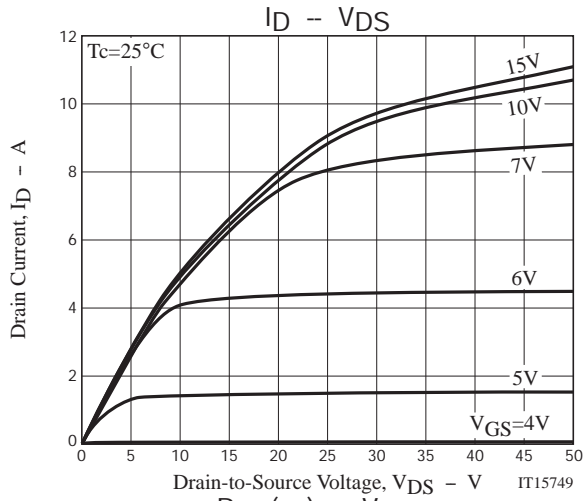
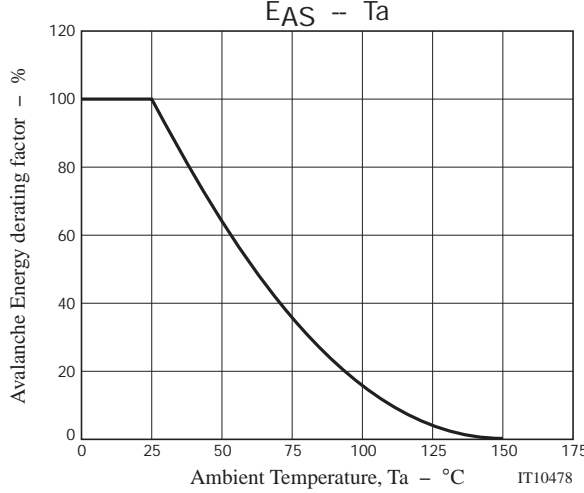
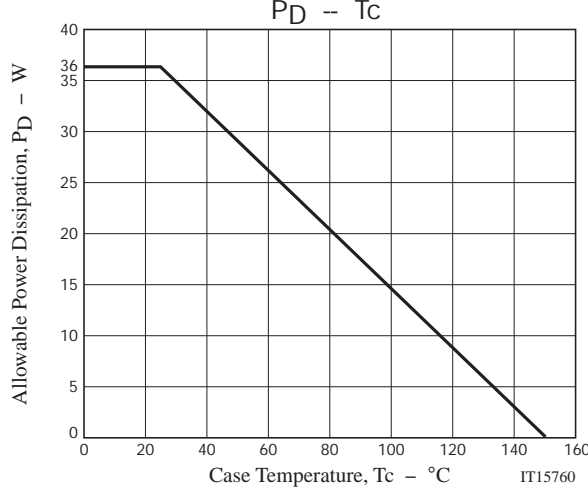
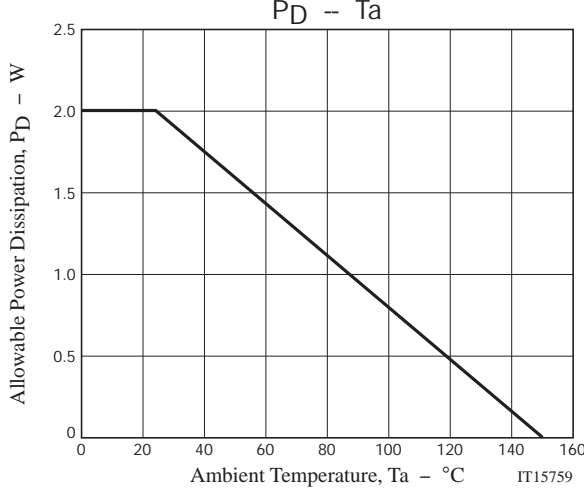
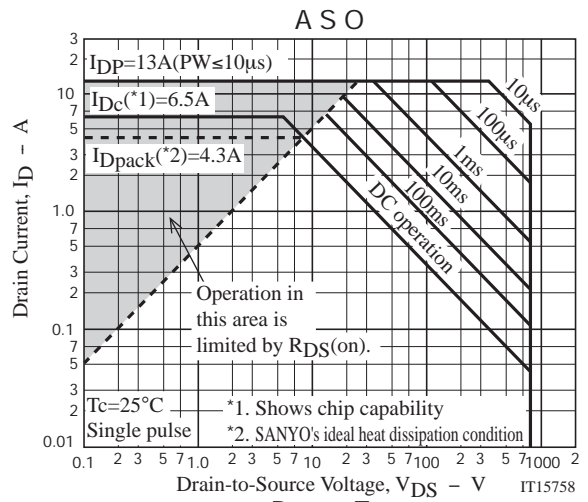
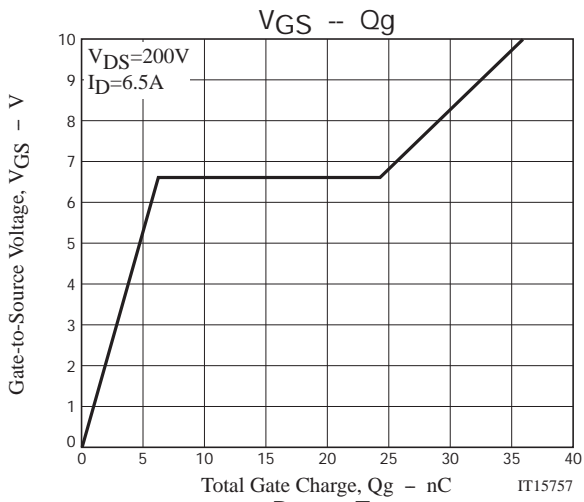


Fig.3 t_{rr} Reverse Recovery Time Test Circuit







Note on usage : Since the BFL4004 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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