Ordering number : ENA1796

SANYO Semiconductors

DATA SHEET

N-Channel Silicon MOSFET

BFL4004 — General-Purpose Switching Device Applications

Features

- ON-resistance $R_{DS}(on)$=1.9Ω (typ.)
- Input capacitance Ciss=710pF (typ.)
- 10V drive

Specifications

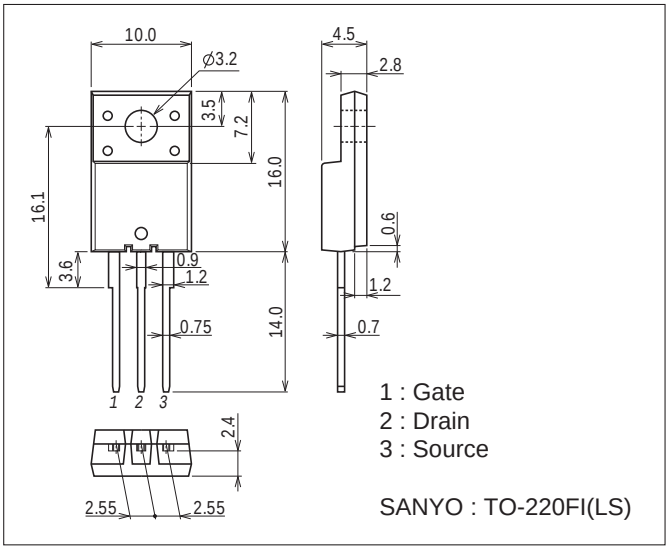
Absolute Maximum Ratings at Ta=25°C

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 Tch=150°C	6.5	A
	I_{Dpack}*2	Tc=25°C (SANYO's ideal heat dissipation condition)*3	4.3	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	13	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C (SANYO's ideal heat dissipation condition)*3	36	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°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}=99V, L=10mH, I_{AV}=6.5A (Fig.1)
*5 L≤10mH, single pulse

Package Dimensions

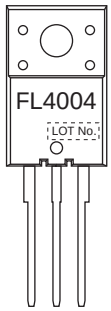
unit : mm (typ)
7509-002



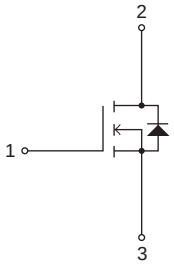
Product & Package Information

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

Marking



Electrical Connection



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}=±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	| yfs |	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	Ciss	V_{DS}=30V, f=1MHz		710		pF
Output Capacitance	Coss	V_{DS}=30V, f=1MHz		120		pF
Reverse Transfer Capacitance	Crss	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	Qg	V_{DS}=200V, V_{GS}=10V, I_D=6.5A		36		nC
Gate-to-Source Charge	Qgs	V_{DS}=200V, V_{GS}=10V, I_D=6.5A		6.2		nC
Gate-to-Drain “Miller” Charge	Qgd	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/μs		5400		nC

Fig.1 Avalanche Resistance Test Circuit

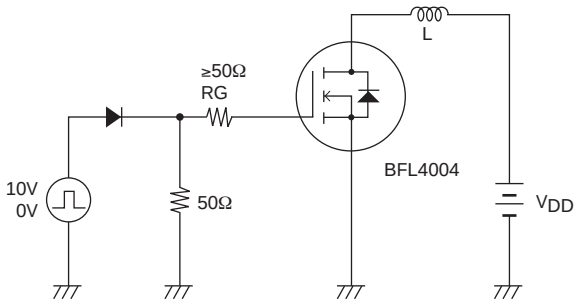


Fig.2 Switching Time Test Circuit

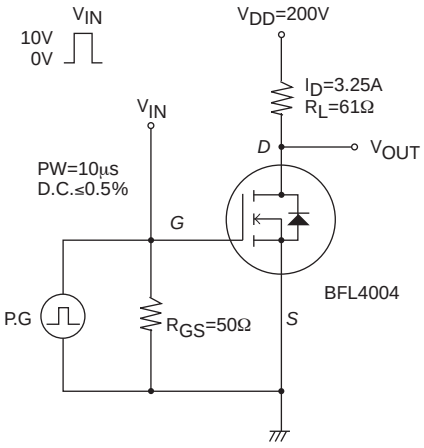
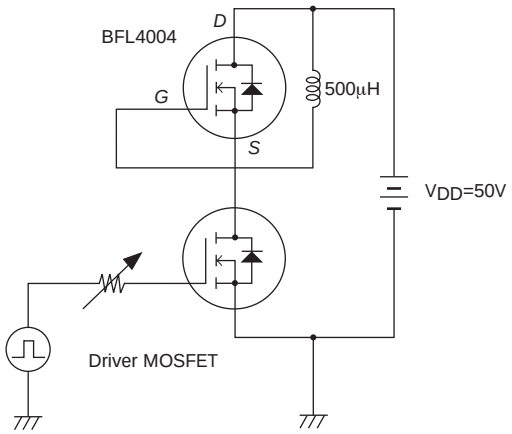
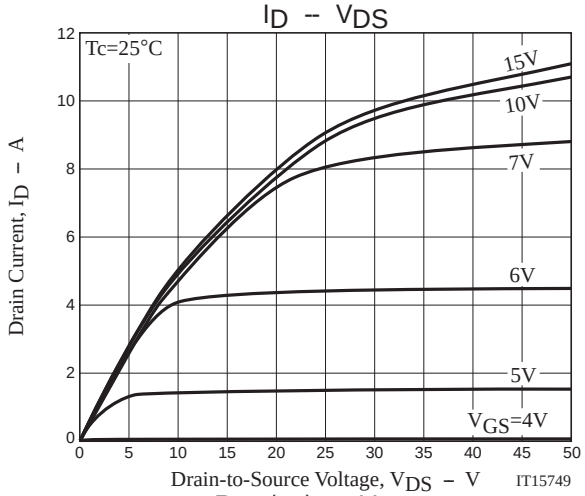


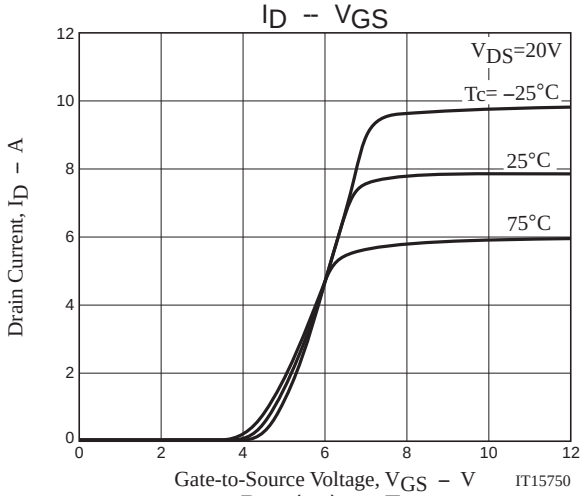
Fig.3 t_{rr} Reverse Recovery Time Test Circuit



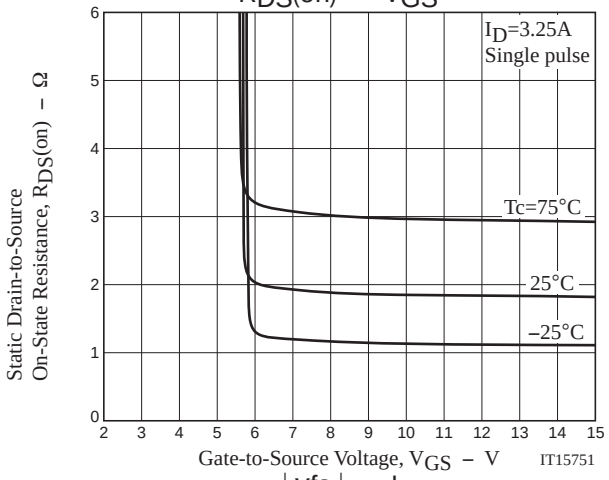
I_D -- V_{DS}



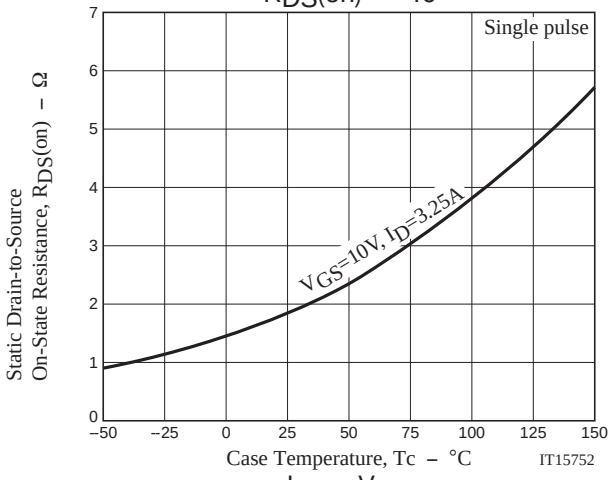
I_D -- V_{GS}



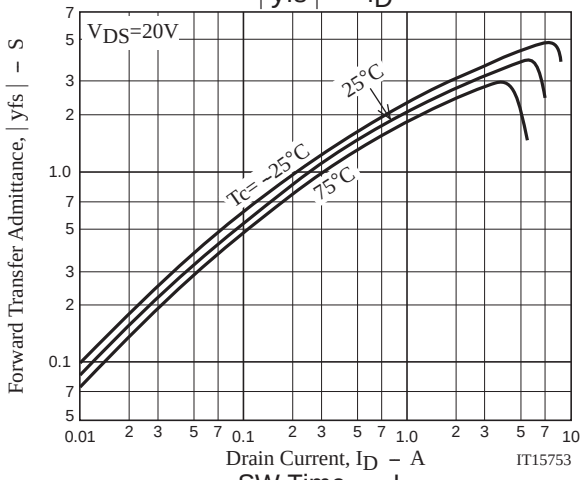
$R_{DS(on)}$ -- V_{GS}



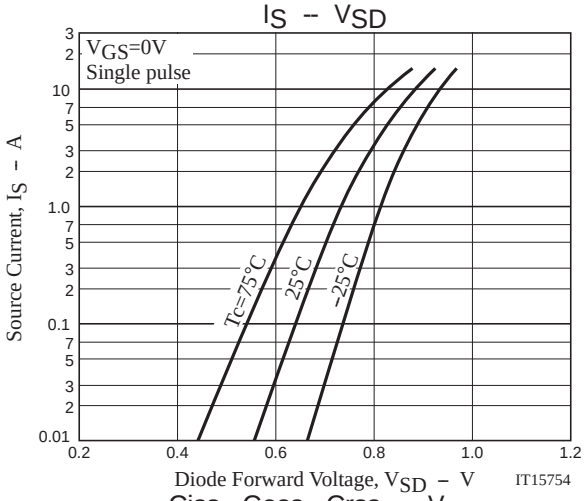
$R_{DS(on)}$ -- Tc



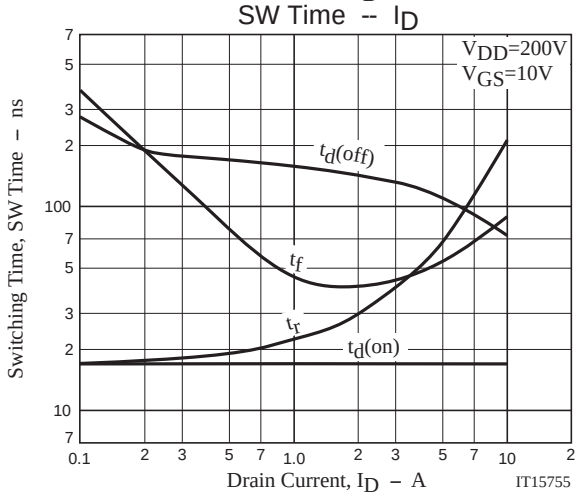
| y_{fs} | -- I_D



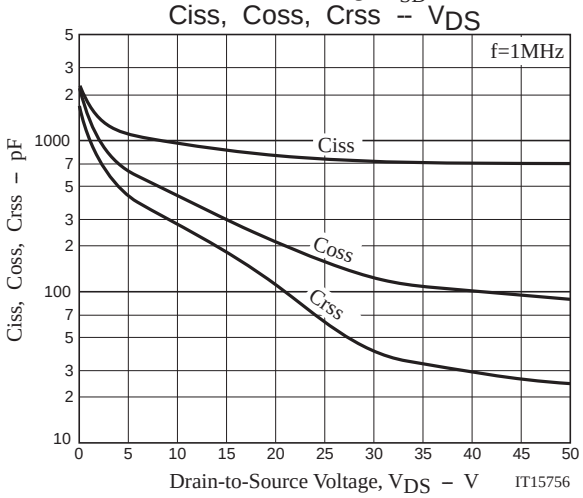
I_S -- V_{SD}

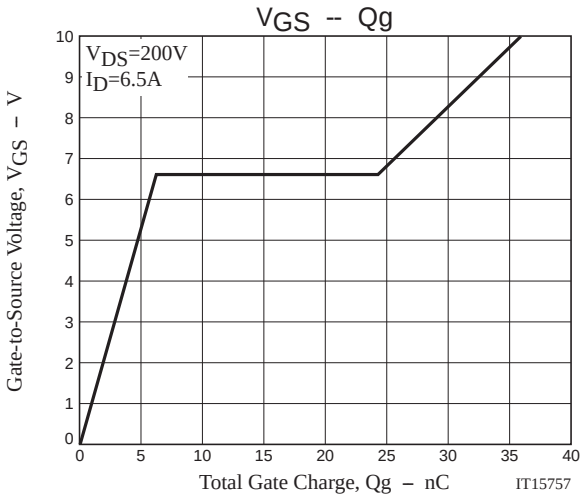


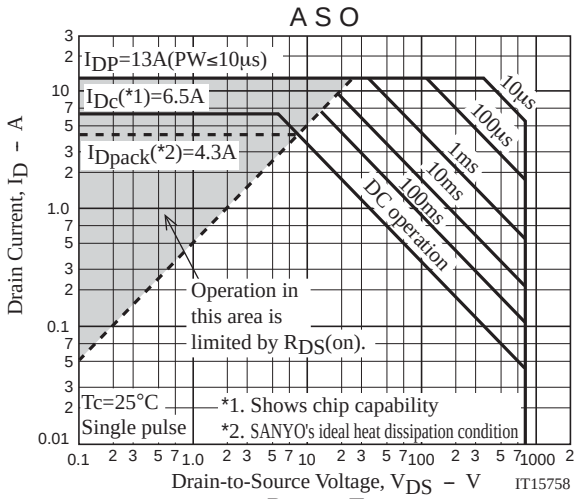
SW Time -- I_D

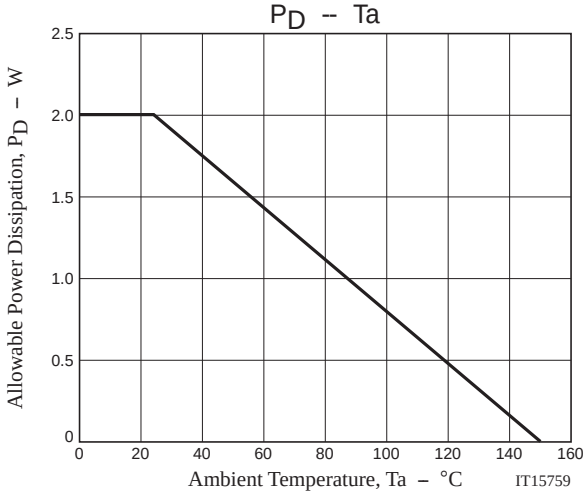


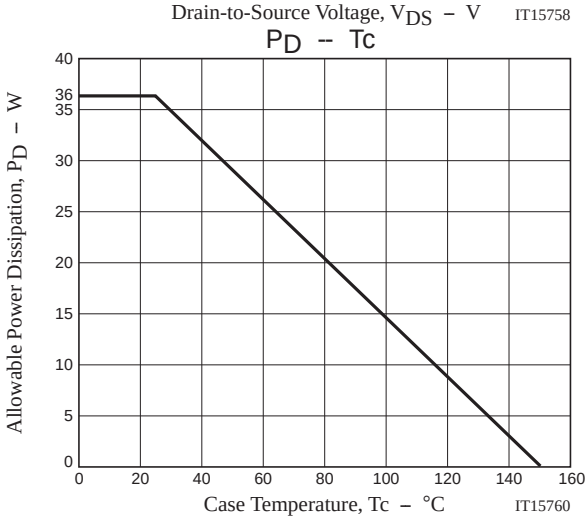
Ciss, Coss, Crss -- V_{DS}

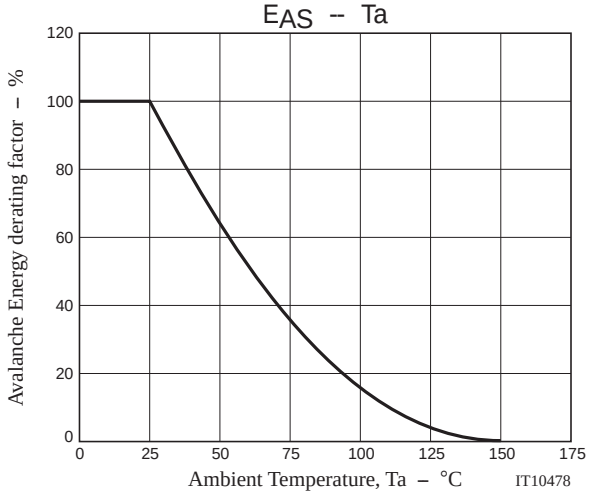












Note on usage : Since the BFL4004 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

This catalog provides information as of July, 2010. Specifications and information herein are subject to change without notice.