Ordering number : ENA1831

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFET

BFL4037 — General-Purpose Switching Device Applications

Features

- ON-resistance $R_{DS}(on)$=0.33Ω (typ.)
- Input capacitance Ciss=1200pF (typ.)
- 10V drive

Specifications

Absolute Maximum Ratings at Ta=25°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 Tch=150°C	16	A
	I_{Dpack}*2	Tc=25°C (SANYO's ideal heat dissipation condition)*3	11	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	60	A
Allowable Power Dissipation	P_D		2.0	W
		Tc=25°C (SANYO's ideal heat dissipation condition)*3	40	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *4	E_{AS}		159	mJ
Avalanche Current *5	I_{AV}		16	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.

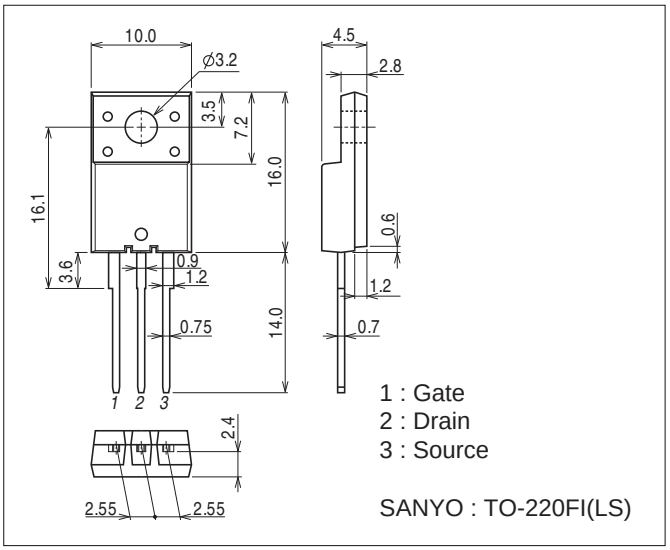
*4 V_{DD}=99V, L=1mH, I_{AV}=16A (Fig.1)

*5 L≤1mH, single pulse

Package Dimensions

unit : mm (typ)

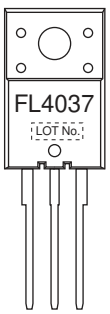
7509-002



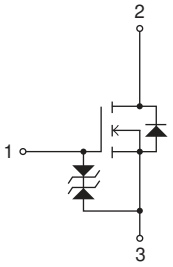
Product & Package Information

- 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	500			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=400V, V_{GS}=0V			100	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±24V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	3		5	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=8A	4.5	9		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=8A, V_{GS}=10V		0.33	0.43	Ω
Input Capacitance	Ciss	V_{DS}=30V, f=1MHz		1200		pF
Output Capacitance	Coss	V_{DS}=30V, f=1MHz		250		pF
Reverse Transfer Capacitance	Crss	V_{DS}=30V, f=1MHz		55		pF
Turn-ON Delay Time	t_d(on)	See Fig.2		26.5		ns
Rise Time	t_r	See Fig.2		78		ns
Turn-OFF Delay Time	t_d(off)	See Fig.2		146		ns
Fall Time	t_f	See Fig.2		57		ns
Total Gate Charge	Qg	V_{DS}=200V, V_{GS}=10V, I_D=16A		48.6		nC
Gate-to-Source Charge	Qgs	V_{DS}=200V, V_{GS}=10V, I_D=16A		8.2		nC
Gate-to-Drain “Miller” Charge	Qgd	V_{DS}=200V, V_{GS}=10V, I_D=16A		27.4		nC
Diode Forward Voltage	V_{SD}	I_S=16A, V_{GS}=0V		0.95	1.3	V
Reverse Recovery Time	t_{rr}	See Fig.3		600		ns
Reverse Recovery Charge	Qrr	I_S=16A, V_{GS}=0V, di/dt=100A/μs		5000		nC

Fig.1 Avalanche Resistance Test Circuit

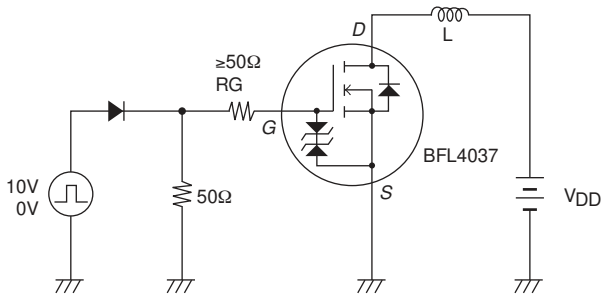


Fig.2 Switching Time Test Circuit

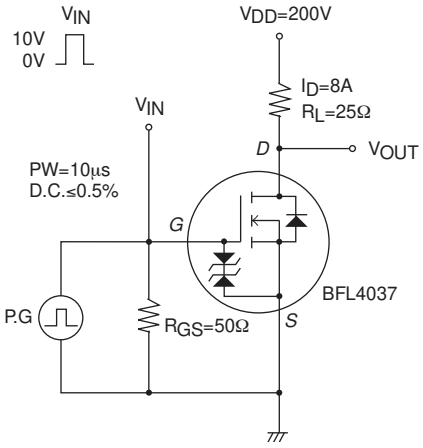
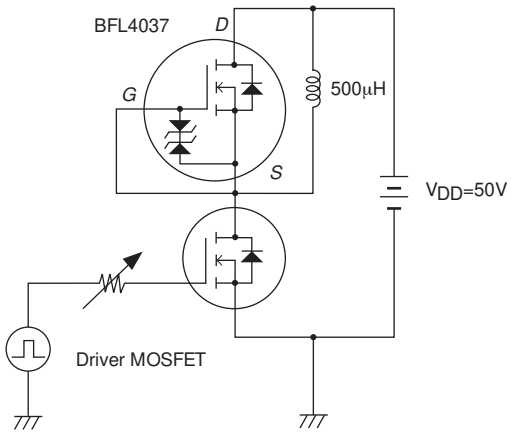
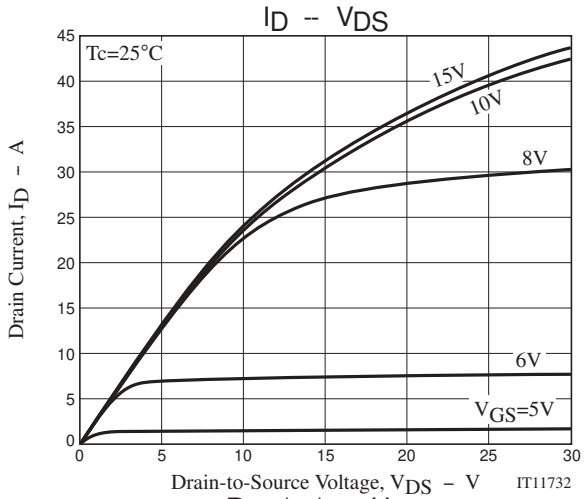
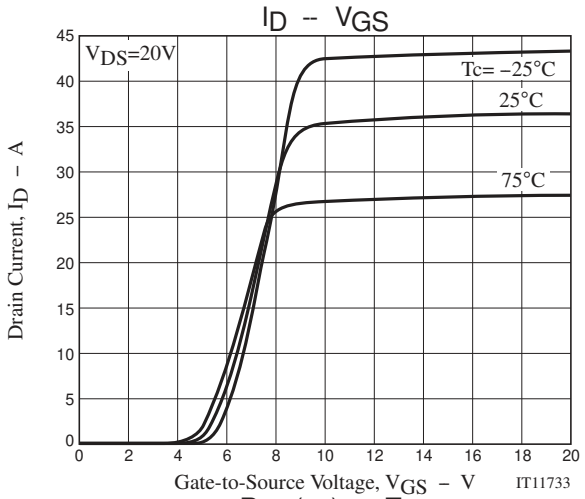
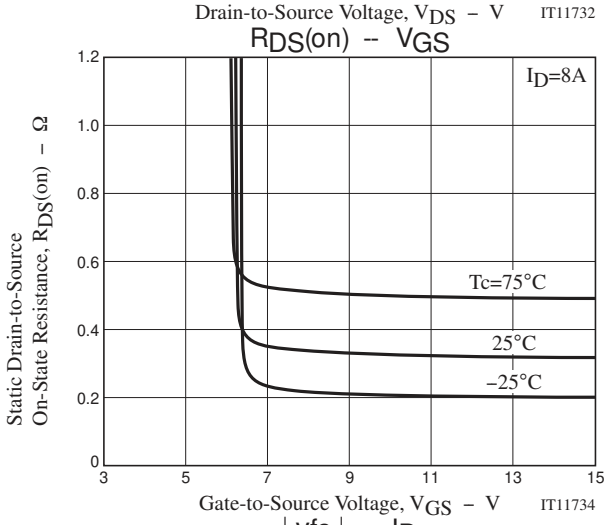


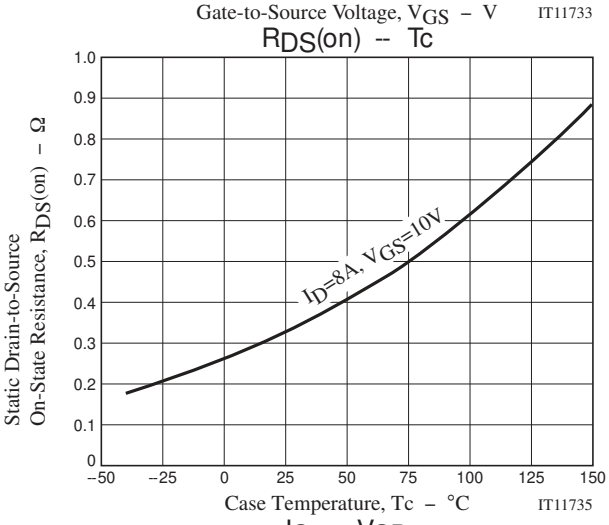
Fig.3 Reverse Recovery Time Test Circuit

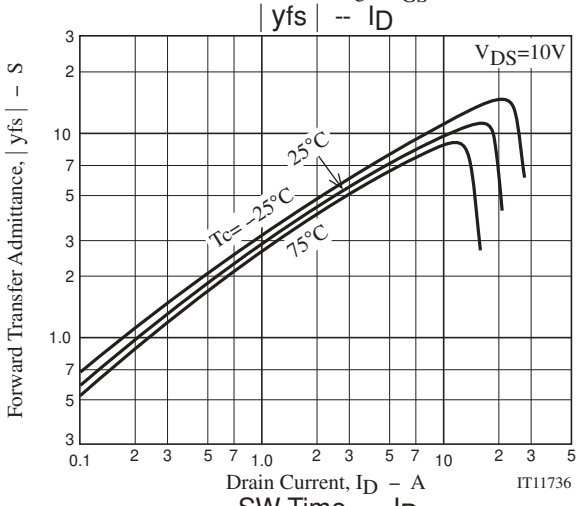


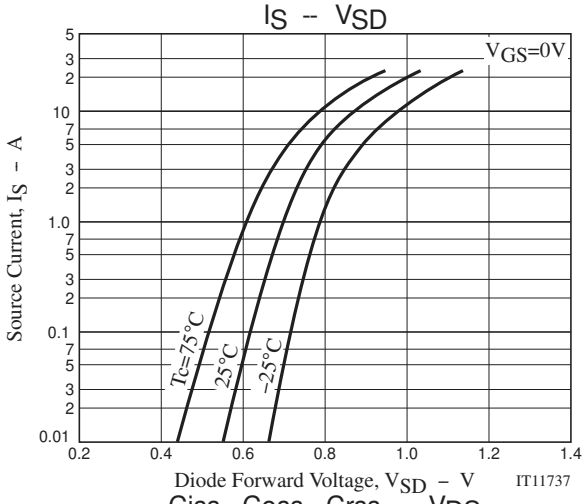

ID -- VDS
Tc=25°C
15V
10V
8V
6V
VGS=5V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT11732

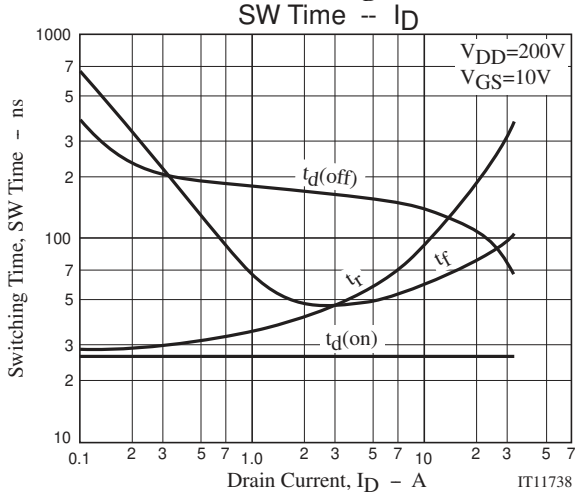

ID -- VGS
VDS=20V
Tc= –25°C
25°C
75°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT11733

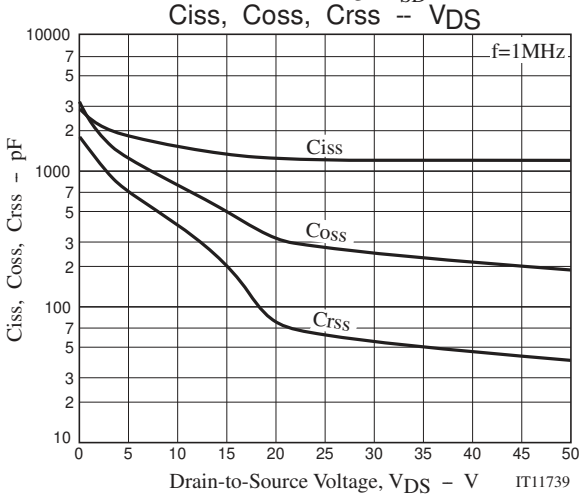

RDS(on) -- VGS
ID=8A
Tc=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
IT11734

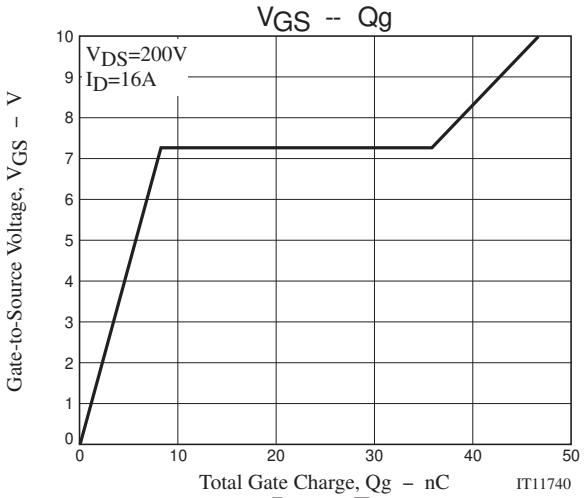

RDS(on) -- Tc
ID=8A, VGS=10V
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C
IT11735

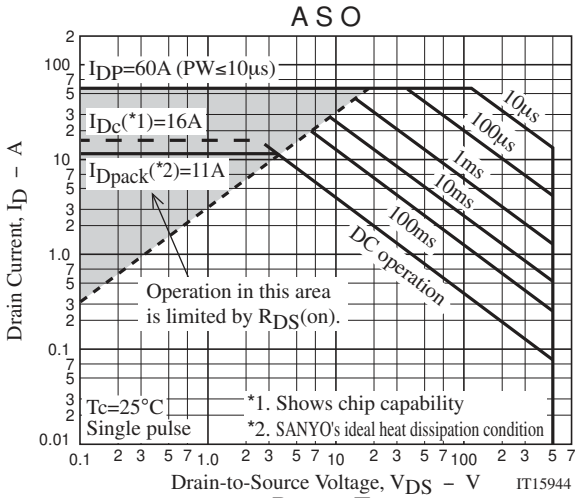

| yfs | -- ID
VDS=10V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT11736

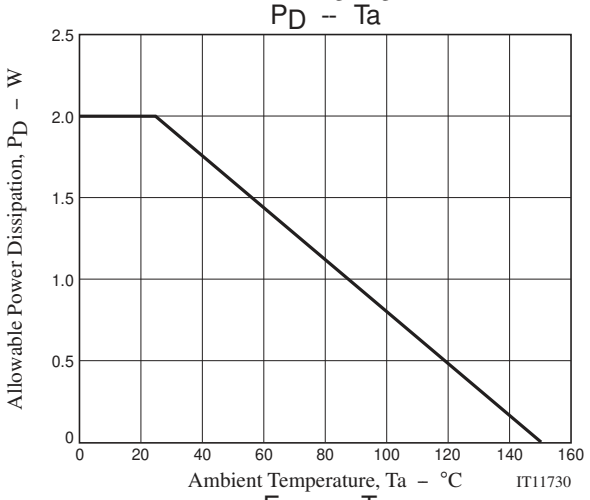

IS -- VSD
VGS=0V
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT11737

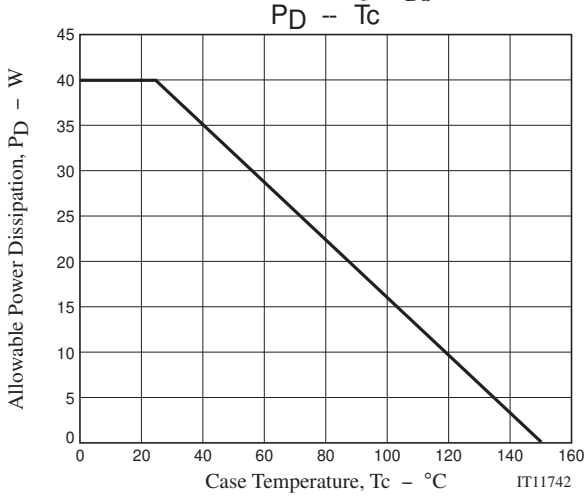

SW Time -- ID
VDD=200V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT11738

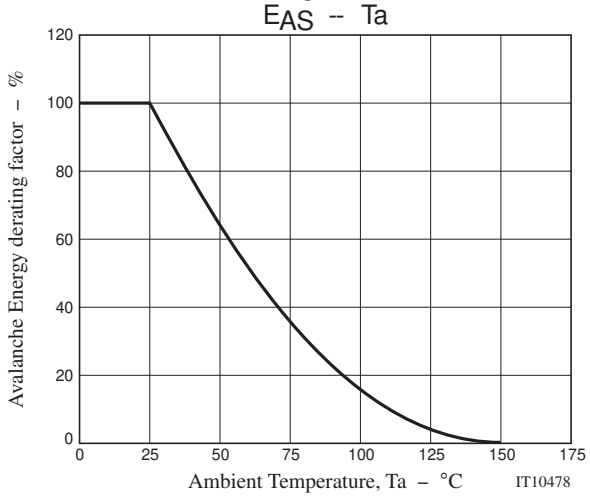

Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT11739


VGS -- Qg
VDS=200V
ID=16A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT11740


A S O
IDP=60A (PW≤10μs)
IDc(*1)=16A
IDpack(*2)=11A
10μs
100μs
1ms
10ms
100ms
DC operation
Operation in this area
is limited by RDS(on).
Tc=25°C
Single pulse
*1. Shows chip capability
*2. SANYO's ideal heat dissipation condition
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT15944


PD -- Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT11730


PD -- Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT11742


EAS -- Ta
Avalanche Energy derating factor – %
Ambient Temperature, Ta – °C
IT10478

Note on usage : Since the BFL4037 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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