Ordering number : ENA1638B

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFET

BFL4001 — General-Purpose Switching Device Applications

Features

- ON-resistance $R_{DS}(on)$=2.1Ω (typ.)
- 10V drive
- Input capacitance Ciss=850pF (typ.)

Specifications

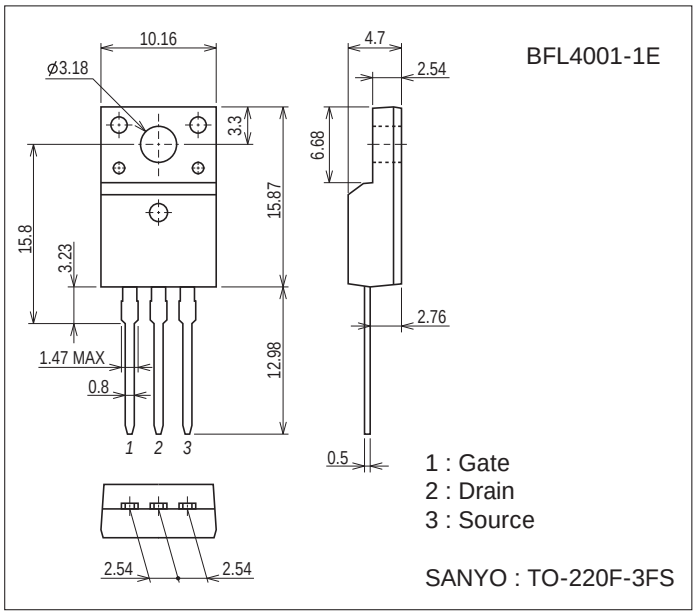
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		900	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	4.1	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	37	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *4	E_{AS}		223	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}=50V, L=10mH, I_{AV}=6.5A
*5 L≤10mH, single pulse

Package Dimensions

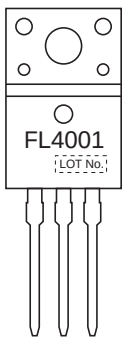
unit : mm (typ)
7528-001



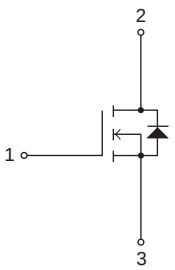
Product & Package Information

- Package : TO-220F-3FS
- JEITA, JEDEC : SC-67
- Minimum Packing Quantity : 50 pcs./magazine

Marking



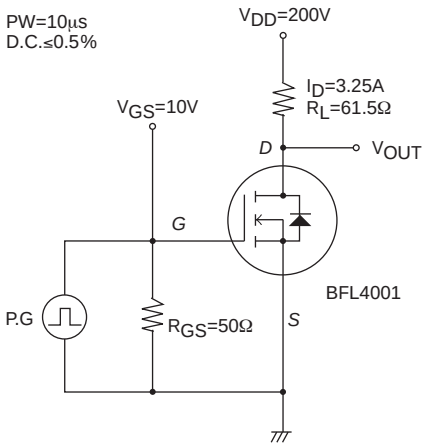
Electrical Connection



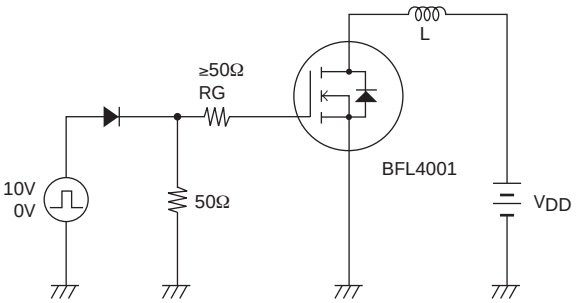
Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=10mA, V_{GS}=0V	900			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=720V, 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	1.8	3.6		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=3.25A, V_{GS}=10V		2.1	2.7	Ω
Input Capacitance	Ciss	V_{DS}=30V, f=1MHz		850		pF
Output Capacitance	Coss			130		pF
Reverse Transfer Capacitance	Crss			43		pF
Turn-ON Delay Time	t_{d}(on)	See specified Test Circuit.		19		ns
Rise Time	t_r			49		ns
Turn-OFF Delay Time	t_{d}(off)			156		ns
Fall Time	t_f			52		ns
Total Gate Charge	Qg	V_{DS}=200V, V_{GS}=10V, I_D=6.5A		44		nC
Gate-to-Source Charge	Qgs			7.0		nC
Gate-to-Drain “Miller” Charge	Qgd			22		nC
Diode Forward Voltage	V_{SD}	I_S=6.5A, V_{GS}=0V		0.85	1.2	V

Switching Time Test Circuit

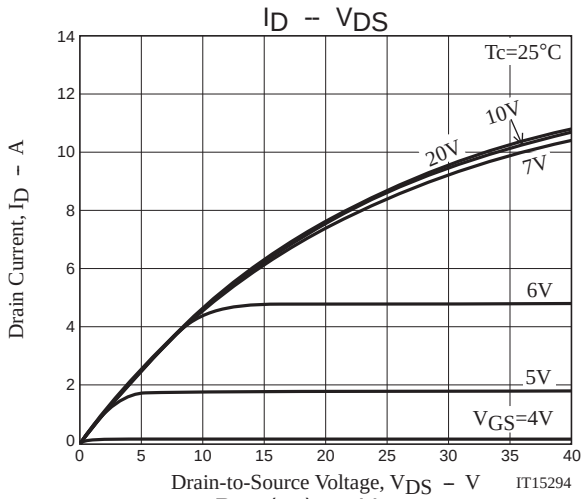


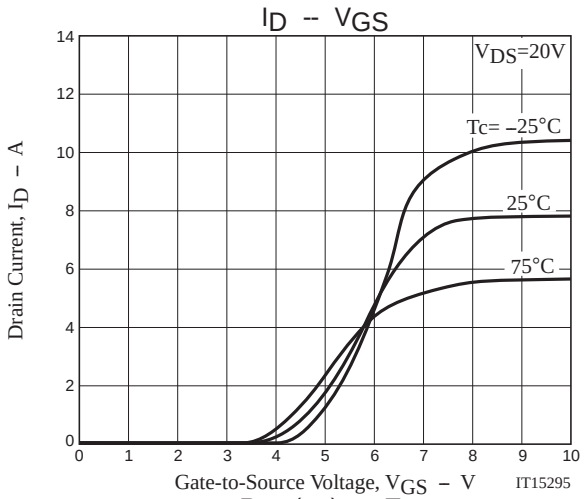
Avalanche Resistance Test Circuit

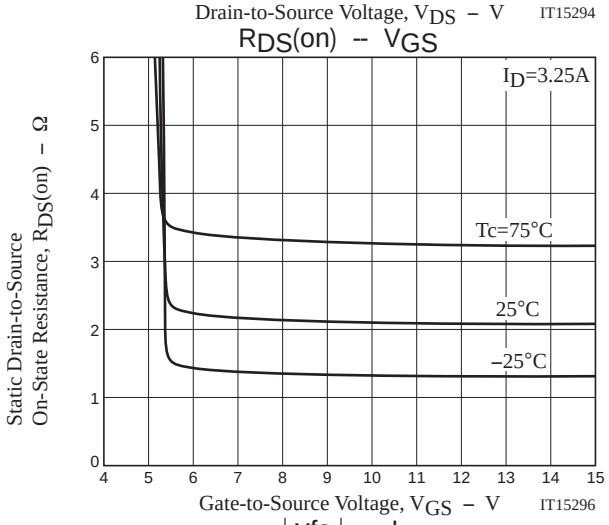


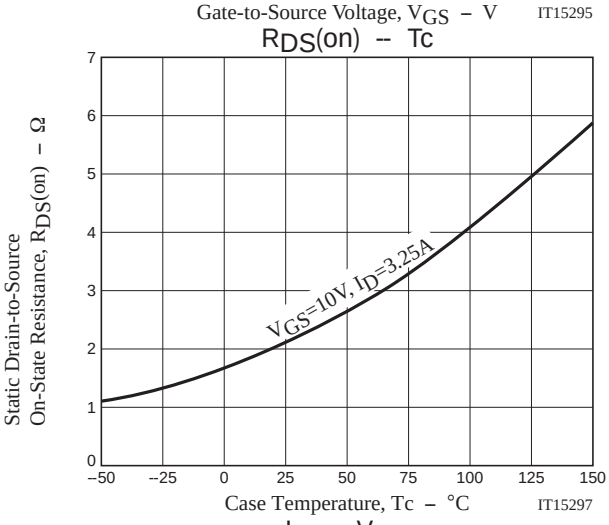
Ordering Information

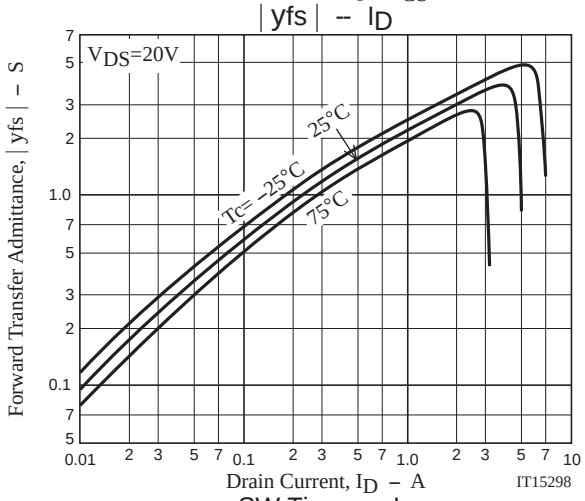
Device	Package	Shipping	memo
BFL4001-1E	TO-220F-3FS	50pcs./magazine	Pb Free

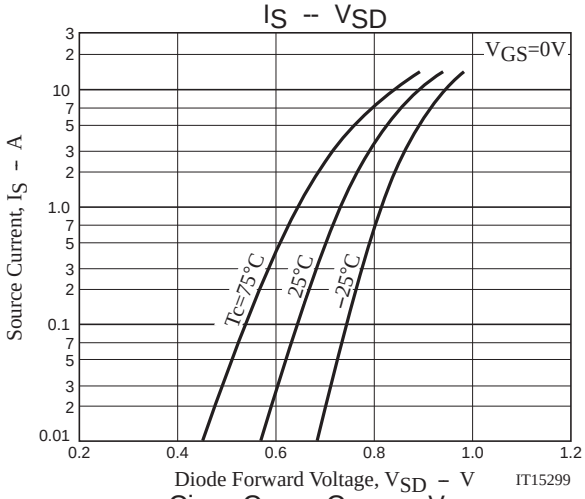

ID -- VDS
Tc=25°C
10V
20V
7V
6V
5V
VGS=4V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT15294

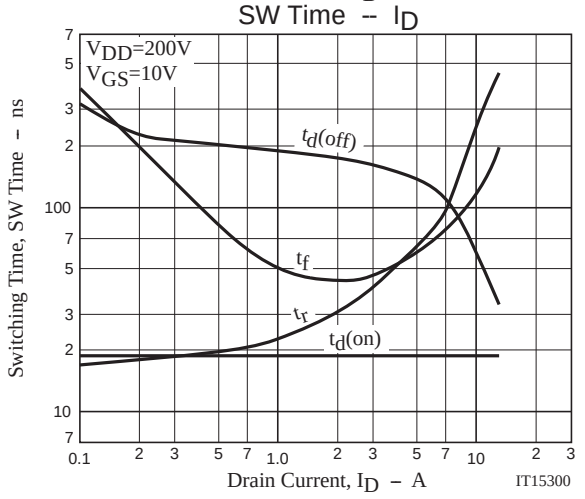

ID -- VGS
VDS=20V
Tc= –25°C
25°C
75°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT15295

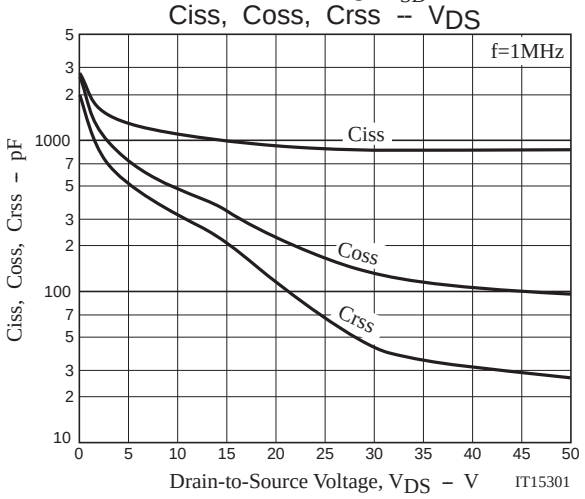

RDS(on) -- VGS
ID=3.25A
Tc=75°C
25°C
–25°C
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
IT15296

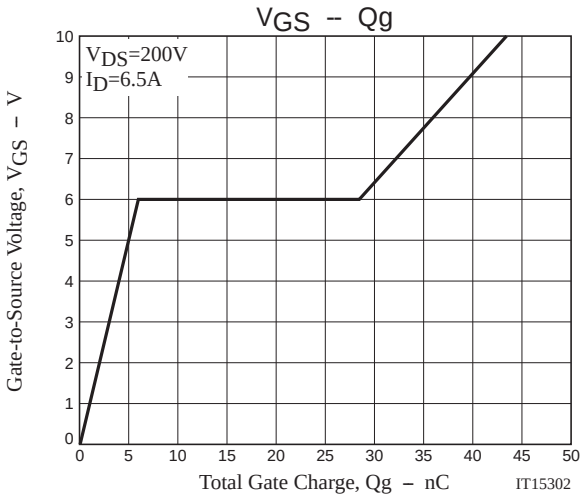

RDS(on) -- Tc
VGS=10V, ID=3.25A
Static Drain-to-Source On-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C
IT15297

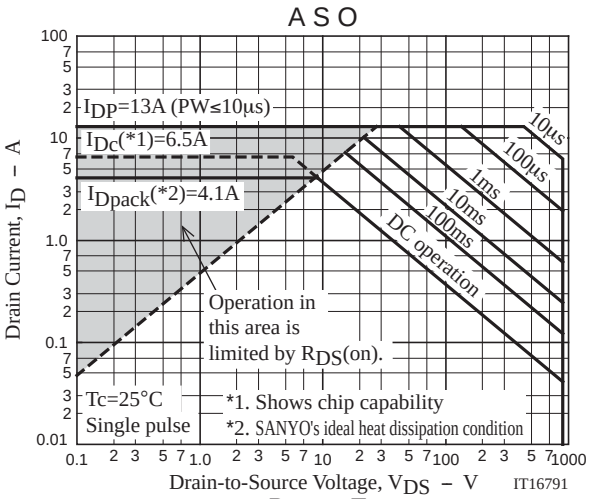

| yfs | -- ID
VDS=20V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT15298

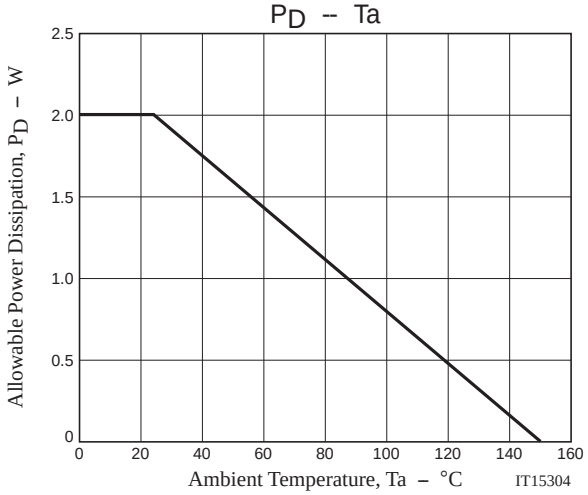

IS -- VSD
VGS=0V
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT15299

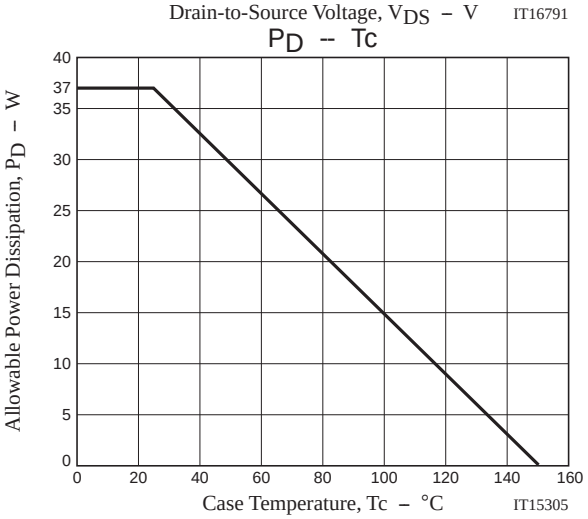

SW Time -- ID
VDD=200V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT15300

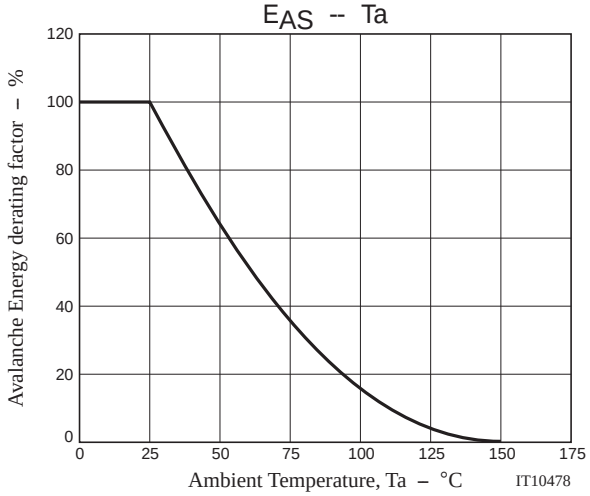

Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT15301


VGS – Qg
VDS=200V
ID=6.5A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT15302


A S O
IDP=13A (PW≤10μs)
IDC(*1)=6.5A
IDpack(*2)=4.1A
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
IT16791


PD -- Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT15304


PD -- Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT15305


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

Magazine Specification

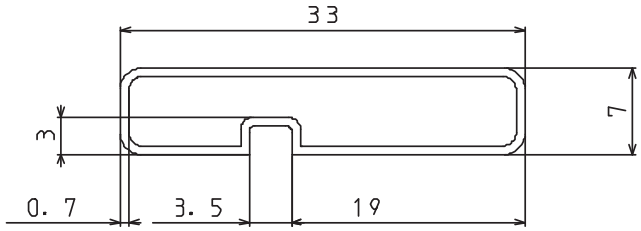
BFL4001-1E

1. Packing Format

Package Name	Magazine Name	Maximum Number of devices contained (pcs)			Packing format	
		Magazine	Inner box	Outer box	Inner BOX	Outer BOX
TO-220F-3FS	TO-220F	50	1,000	4,000	SPD-0V0001 20 magazines contained Dimensions:mm (external) 568×150×55	SPT-081029 4 inner boxes contained Dimensions:mm (external) 590×225×178

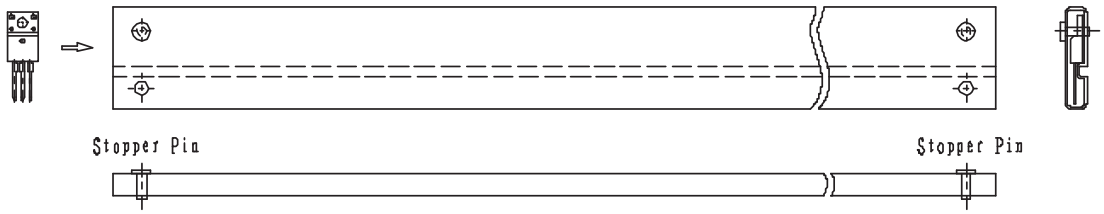
2. Magazine dimensions

(unit:mm)

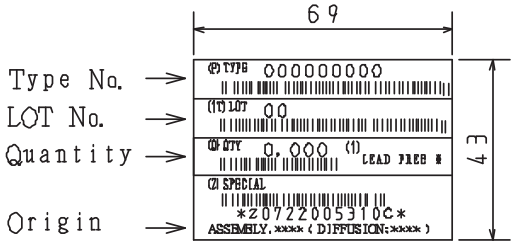


Tolerance=±0.3mm
Thickness=0.7±0.2mm
Length =532.5±2mm
Material =PVC (Antistatic treatment)

3. Storage method to magazine

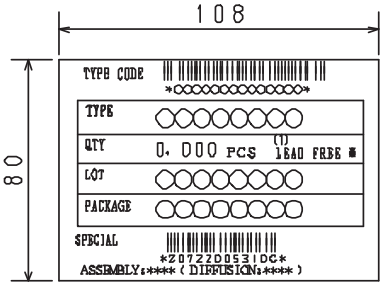


4. Inner box label (unit:mm)



5. Outer box label (unit:mm)

It is a label at the time of factory shipments.
The form of a label may change in physical distribution process.

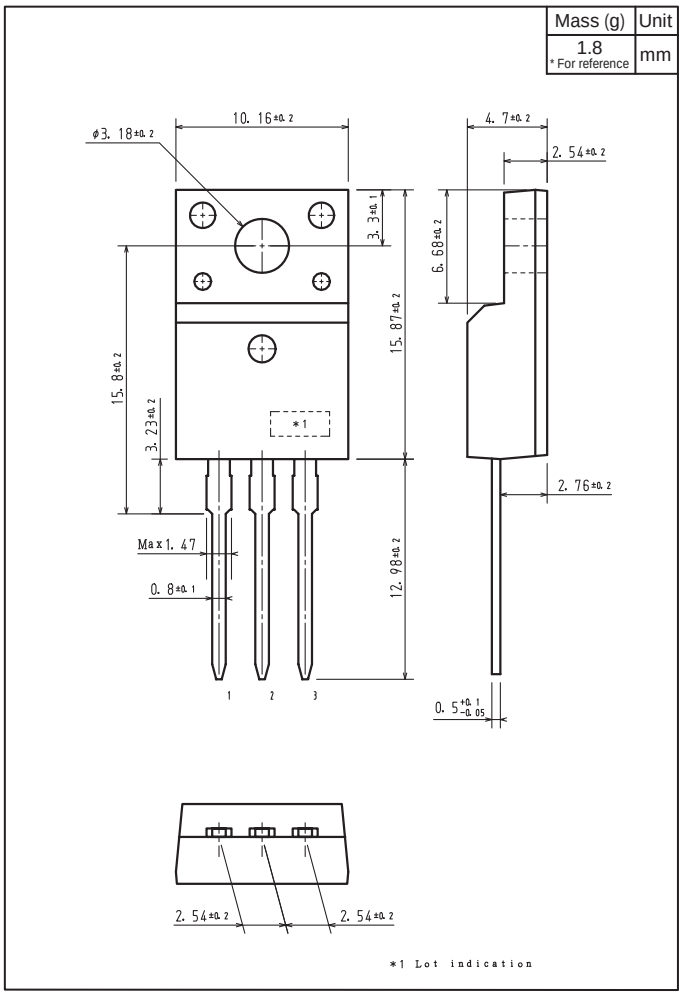


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A

Outline Drawing

BFL4001-1E



Note on usage : Since the BFL4001 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

This catalog provides information as of June, 2012. Specifications and information herein are subject to change without notice.