



BFL4004 — N-Channel Silicon MOSFET

General-Purpose Switching Device Applications

Features

- ON-resistance $R_{DS(on)}=1.9\Omega$ (typ.)
- Input capacitance $C_{iss}=710pF$ (typ.)
- 10V drive

Specifications

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

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 $T_{ch}=150^\circ C$	6.5	A
	I_{Dpack}^{*2}	$T_c=25^\circ C$ (SANYO's ideal heat dissipation condition)*3	4.3	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu s$, duty cycle $\leq 1\%$	13	A
Allowable Power Dissipation	P_D		2.0	W
		$T_c=25^\circ C$ (SANYO's ideal heat dissipation condition)*3	36	W
Channel Temperature	T_{ch}		150	$^\circ C$
Storage Temperature	T_{stg}		-55 to +150	$^\circ C$
Avalanche Energy (Single Pulse) *4	E_{AS}		225	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.

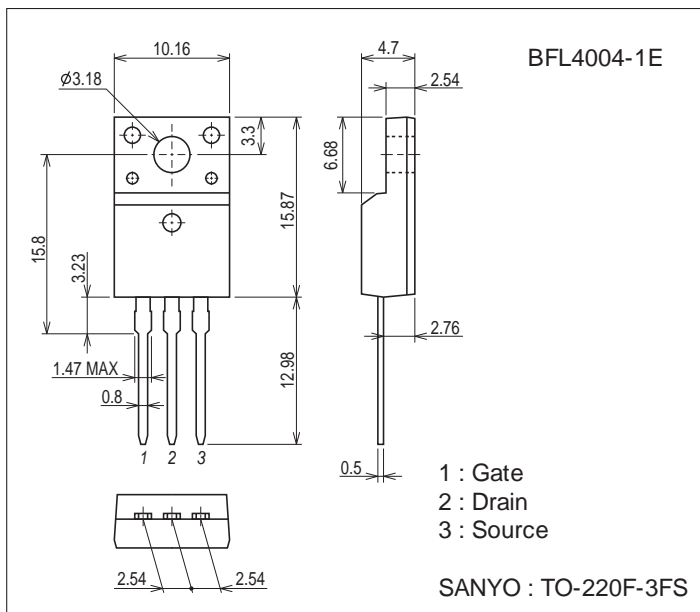
*4 $V_{DD}=50V$, $L=10mH$, $I_{AV}=6.5A$ (Fig.1)

*5 $L \leq 10mH$, single pulse

Package Dimensions

unit : mm (typ)

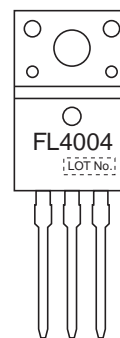
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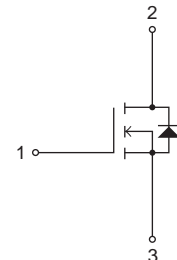
Product & Package Information

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

Marking



Electrical Connection



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}				120		pF
Reverse Transfer Capacitance	C_{rss}				42		pF
Turn-ON Delay Time	$t_{d(on)}$		See Fig.2		17		ns
Rise Time	t_r				44		ns
Turn-OFF Delay Time	$t_{d(off)}$				130		ns
Fall Time	t_f				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}				6.2		nC
Gate-to-Drain "Miller" Charge	Q_{gd}				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		970		ns	
Reverse Recovery Charge	Q_{rr}	$I_S=6.5A, V_{GS}=0V, di/dt=100A/\mu s$		6700		nC	

Fig.1 Unclamped Inductive Switching Test Circuit

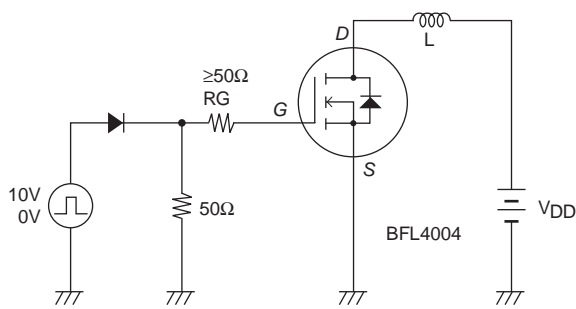


Fig.2 Switching Time Test Circuit

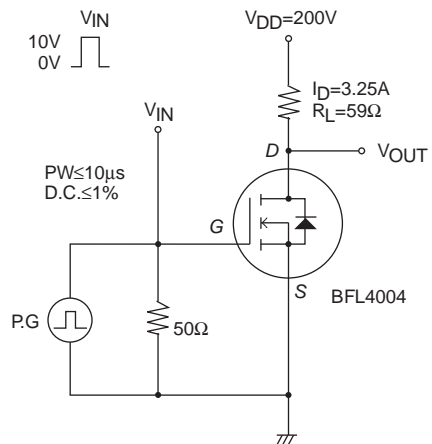
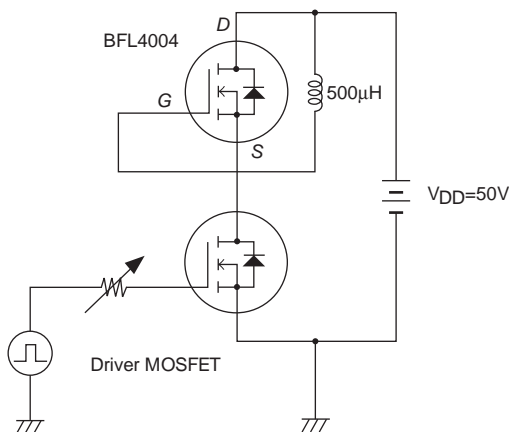
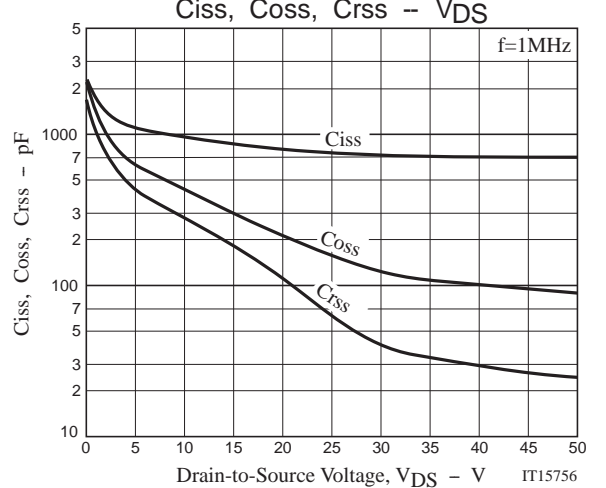
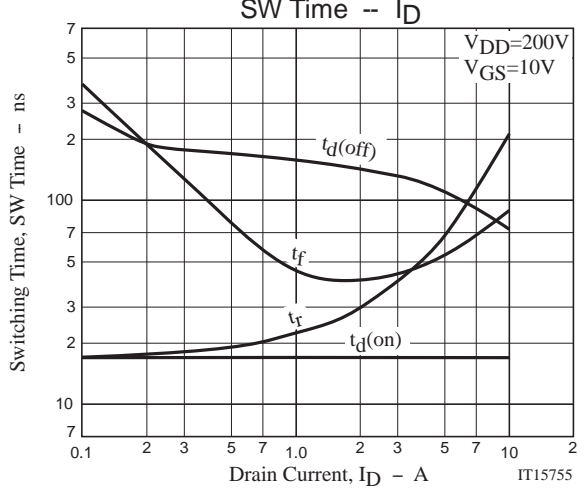
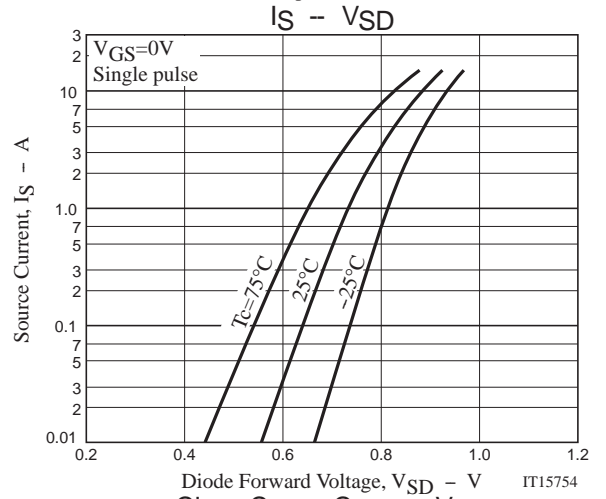
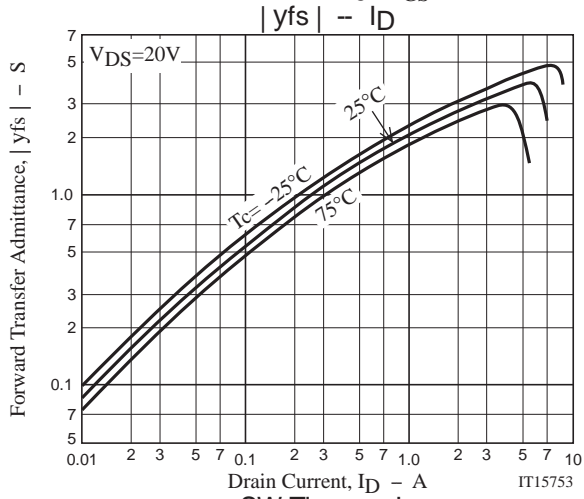
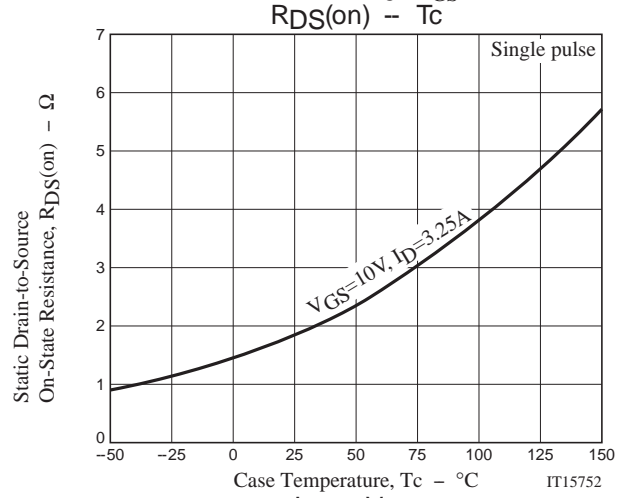
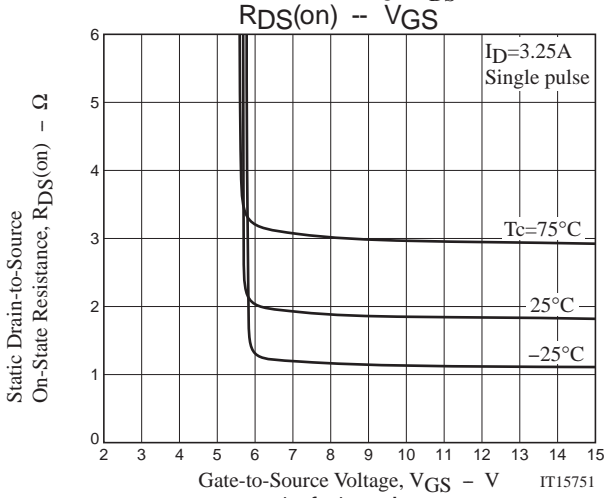
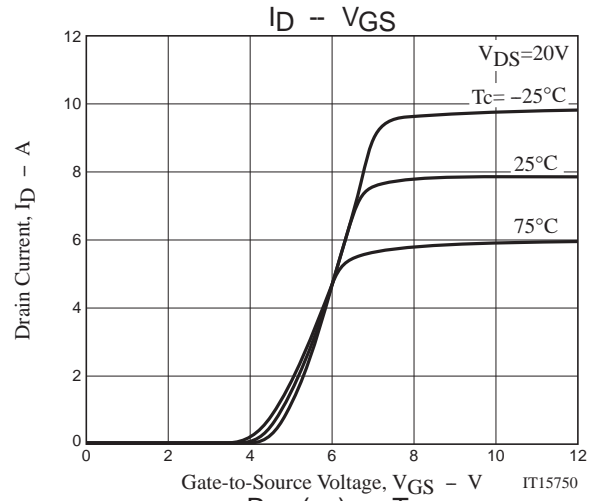
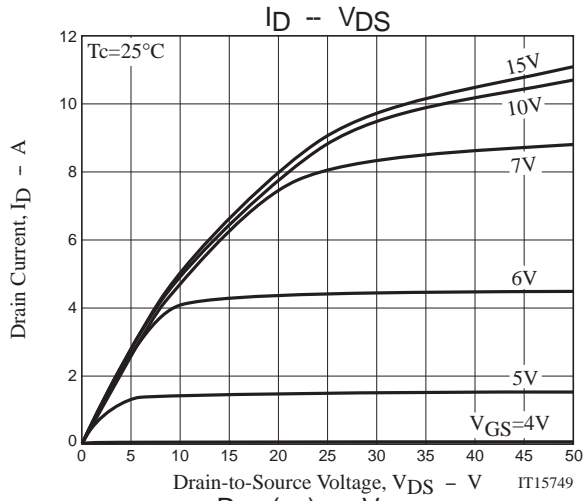


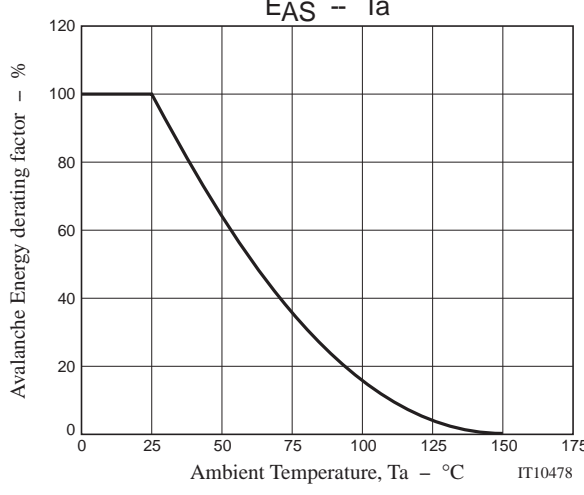
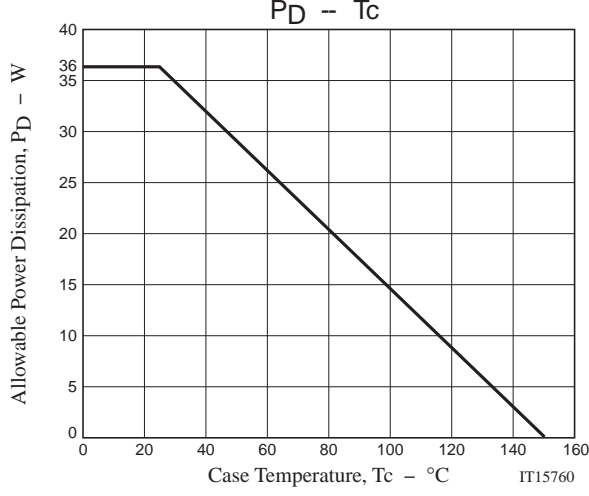
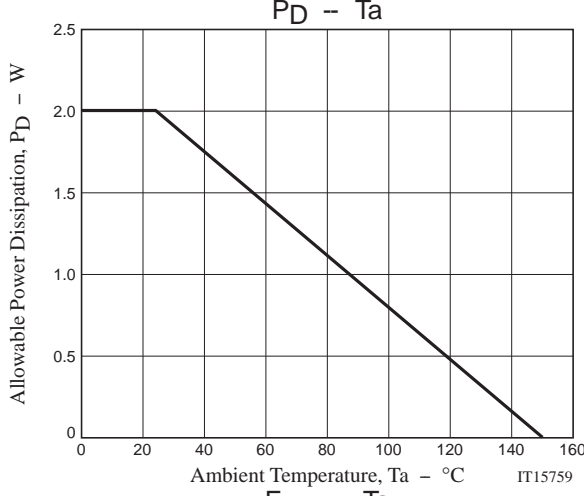
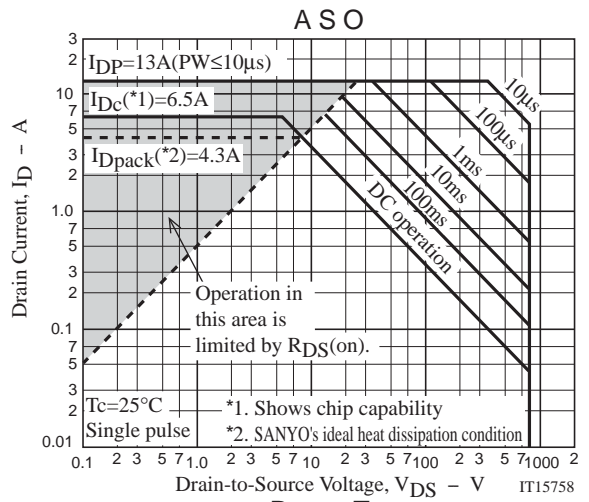
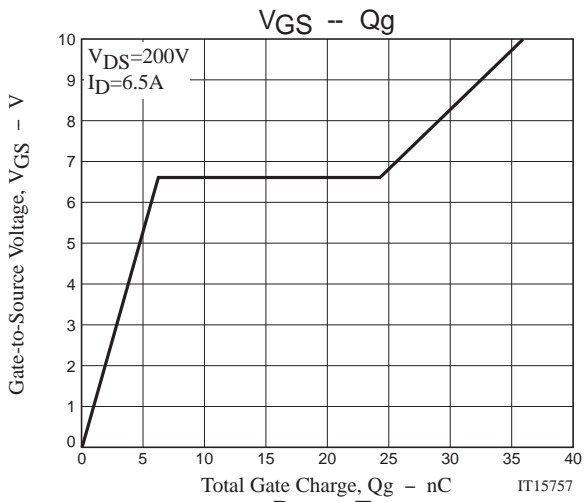
Fig.3 Reverse Recovery Time Test Circuit



Ordering Information

Device	Package	Shipping	memo
BFL4004-1E	TO-220F-3FS	50pcs./tube	Pb Free





Magazine Specification

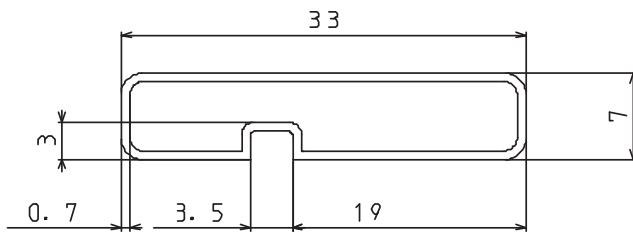
BFL4004-1E

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

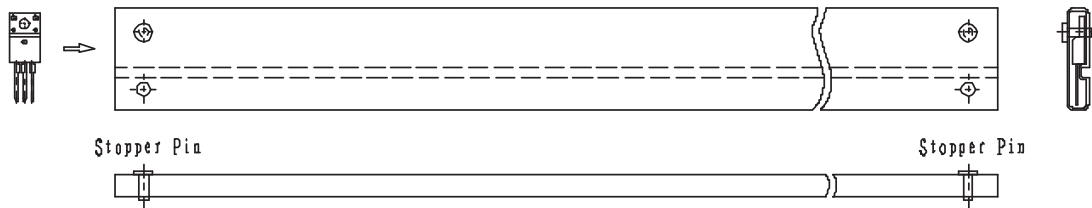
2. Magazine dimensions

(unit:mm)

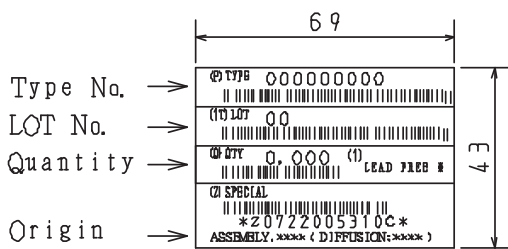


Tolerance=±0.3mm
 Thickness=0.7±0.2mm
 Length =532.5±2mm
 Material =PVC (Antistatic treatment)

3. Storage method to magazine

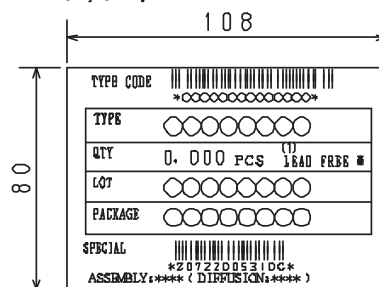


4. Inner box label (unit:mm)



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)

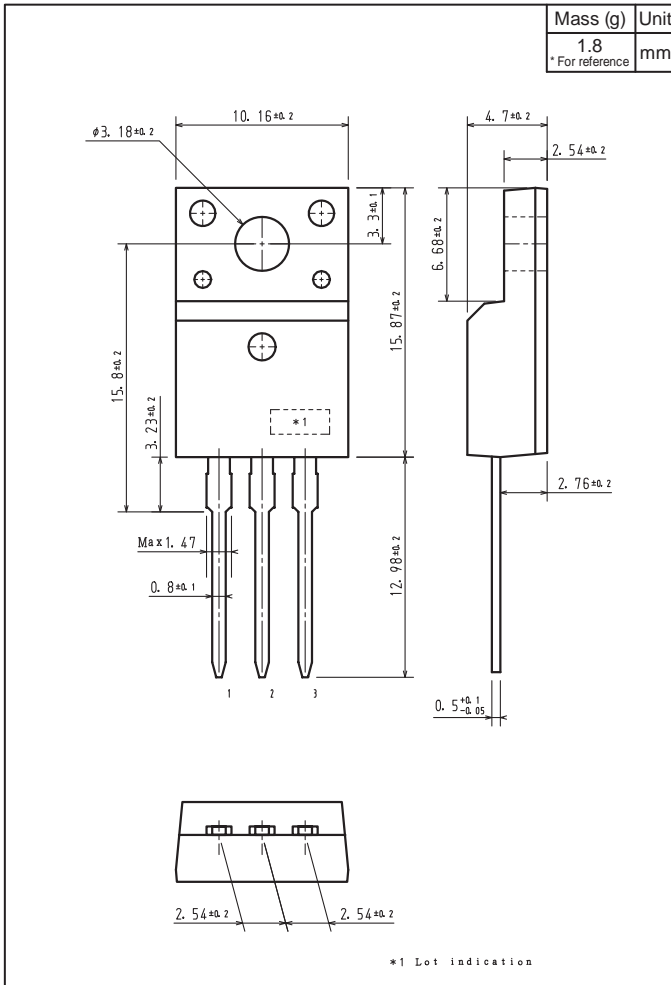
The LEAD FREE * description shows that the surface treatment of the terminal is lead free.

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A

BFL4004

Outline Drawing

BFL4004-1E



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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