Ordering number : ENA0523B

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFET

2SK4094 — General-Purpose Switching Device Applications

Features

- ON-resistance $R_{DS}(on)1=3.8m\Omega$ (typ.)
- Input capacitance Ciss=12500pF (typ.)
- 4V drive

Specifications

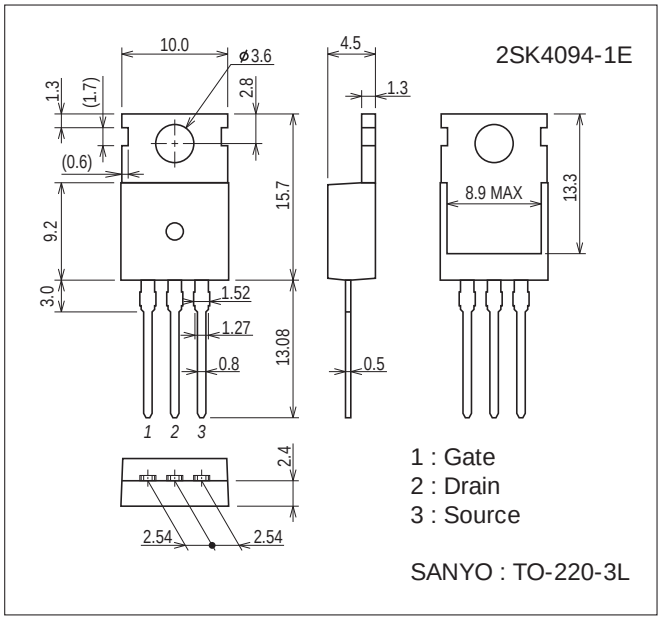
Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		60	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D		100	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	400	A
Allowable Power Dissipation	P_D		1.75	W
		Tc=25°C	90	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		850	mJ
Avalanche Current *2	I_{AV}		70	A

Note :*1 V_{DD}=30V, L=200μH, I_{AV}=70A (Fig.1)
*2 L≤200μH, single pulse

Package Dimensions

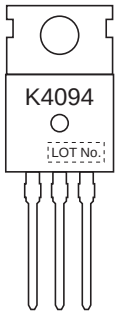
unit : mm (typ)
7536-001



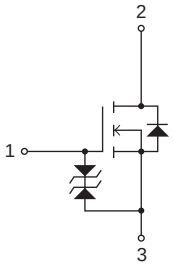
Product & Package Information

- Package : TO-220-3L
- JEITA, JEDEC : SC-46, TO-220AB
- 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=1mA, V_{GS}=0V	60			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=16V, V_{DS}=0V			±10	μA
Cutoff Voltage	V_{GS}(off)	V_{DS}=10V, I_D=1mA	1.2		2.6	V
Forward Transfer Admittance	| yfs |	V_{DS}=10V, I_D=50A	45	75		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)1	I_D=50A, V_{GS}=10V		3.8	5.0	mΩ
	R_{DS}(on)2	I_D=50A, V_{GS}=4V		4.9	7.0	mΩ
Input Capacitance	Ciss	V_{DS}=20V, f=1MHz		12500		pF
Output Capacitance	Coss			1200		pF
Reverse Transfer Capacitance	Crss			950		pF
Turn-ON Delay Time	t_d(on)	See Fig.2		80		ns
Rise Time	t_r			630		ns
Turn-OFF Delay Time	t_d(off)			860		ns
Fall Time	t_f			750		ns
Total Gate Charge	Qg	V_{DS}=30V, V_{GS}=10V, I_D=100A		220		nC
Gate-to-Source Charge	Qgs			30		nC
Gate-to-Drain “Miller” Charge	Qgd			55		nC
Diode Forward Voltage	V_{SD}	I_S=100A, V_{GS}=0V		1.0	1.2	V

Fig.1 Avalanche Resistance Test Circuit

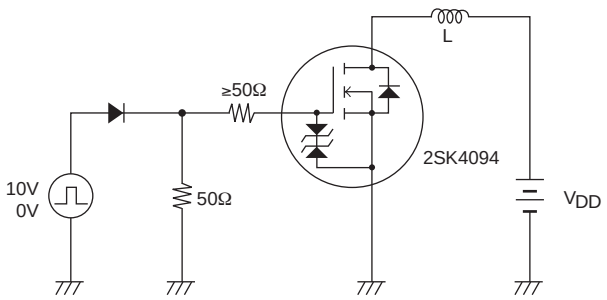
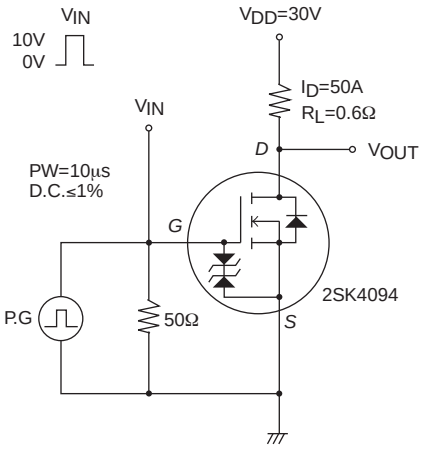
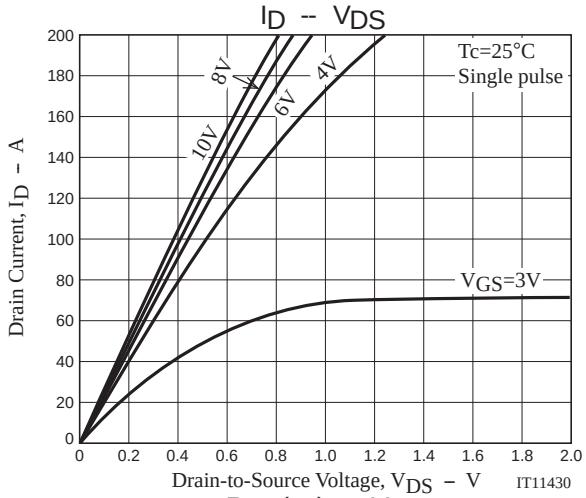


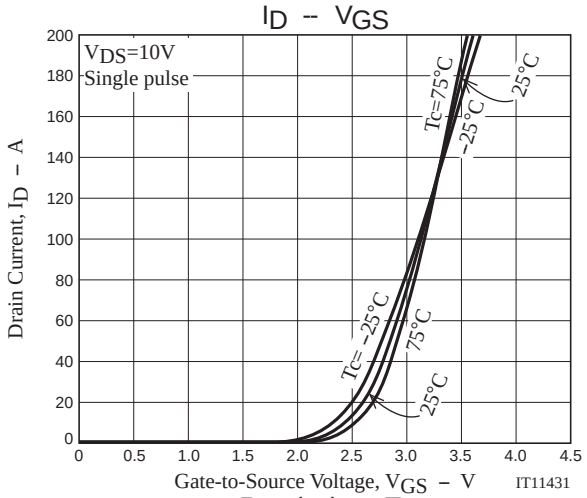
Fig.2 Switching Time Test Circuit

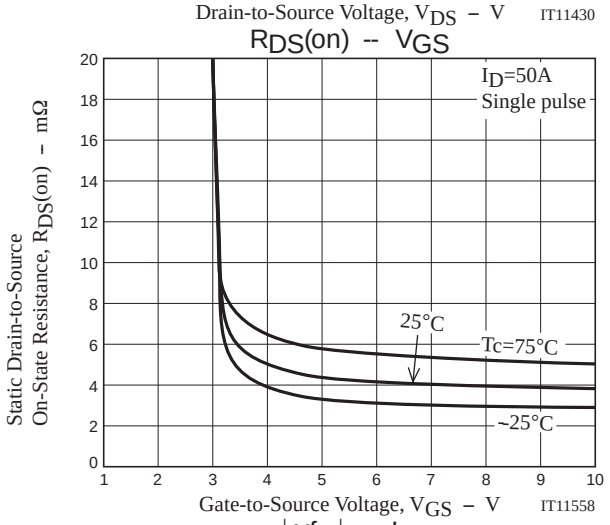


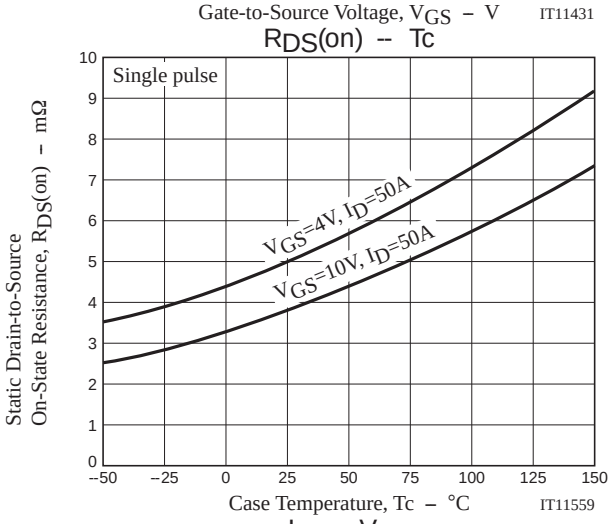
Ordering Information

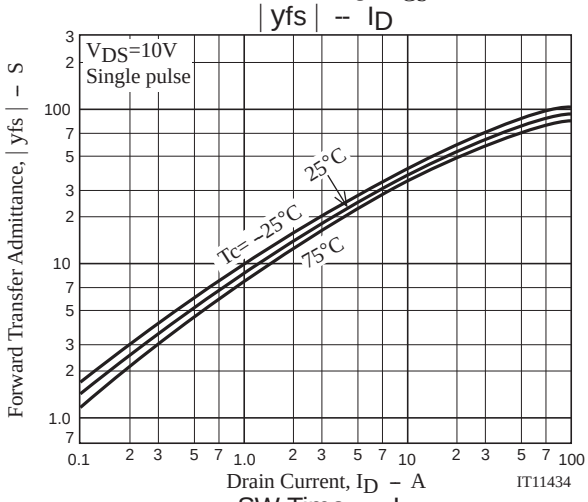
Device	Package	Shipping	memo
2SK4094-1E	TO-220-3L	50pcs./magazine	Pb Free

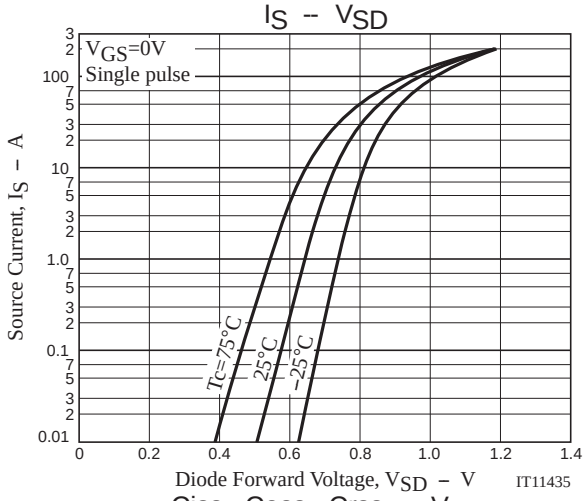

ID -- VDS
Tc=25°C
Single pulse
8V
10V
6V
4V
VGS=3V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT11430

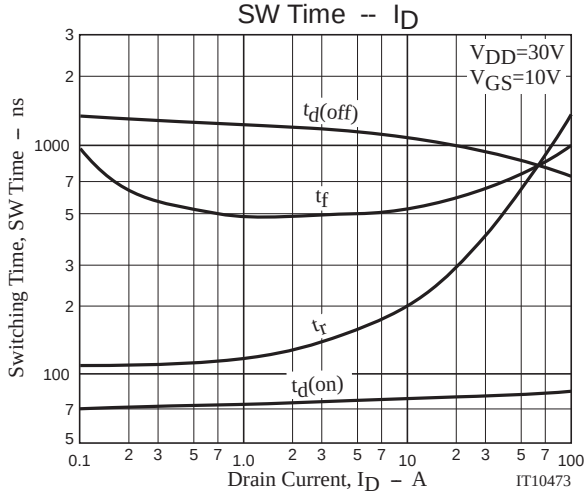

ID -- VGS
VDS=10V
Single pulse
Tc=75°C
25°C
–25°C
Tc= –25°C
75°C
25°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT11431

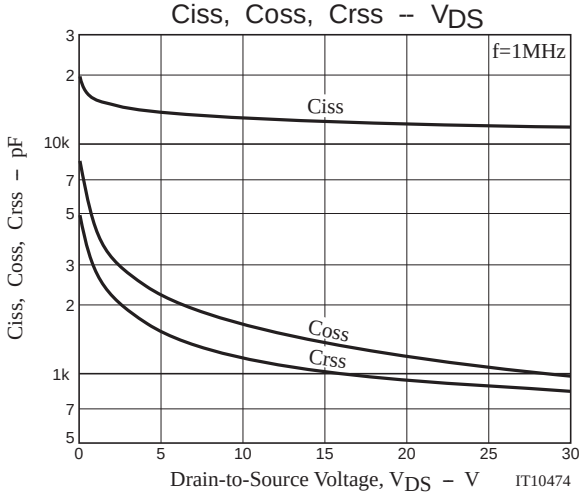

RDS(on) -- VGS
ID=50A
Single pulse
25°C
Tc=75°C
–25°C
Static Drain-to-Source
On-State Resistance, RDS(on) – mΩ
Gate-to-Source Voltage, VGS – V
IT11558

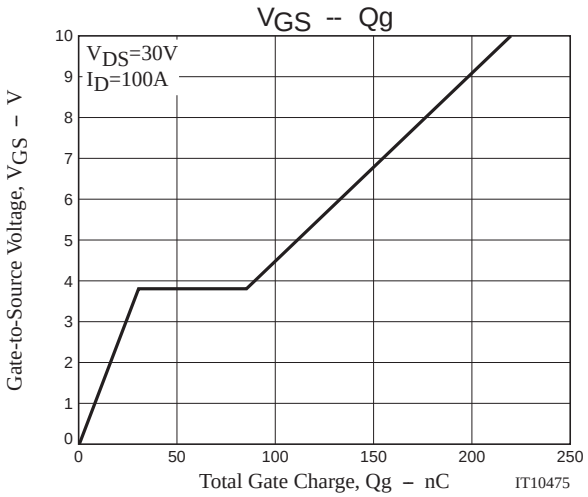

RDS(on) -- Tc
Single pulse
VGS=4V, ID=50A
VGS=10V, ID=50A
Static Drain-to-Source
On-State Resistance, RDS(on) – mΩ
Case Temperature, Tc – °C
IT11559

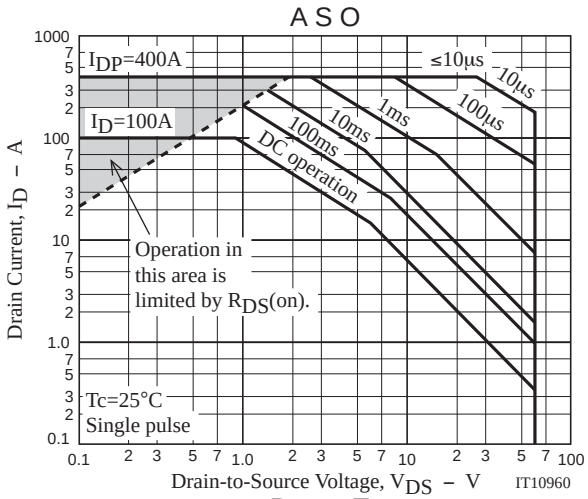

| yfs | -- ID
VDS=10V
Single pulse
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT11434

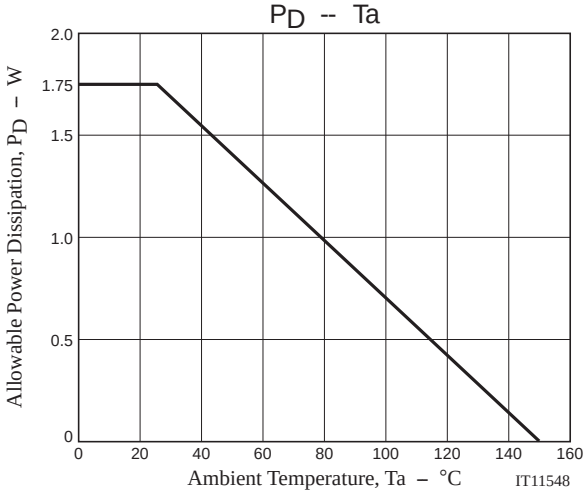

IS -- VSD
VGS=0V
Single pulse
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT11435

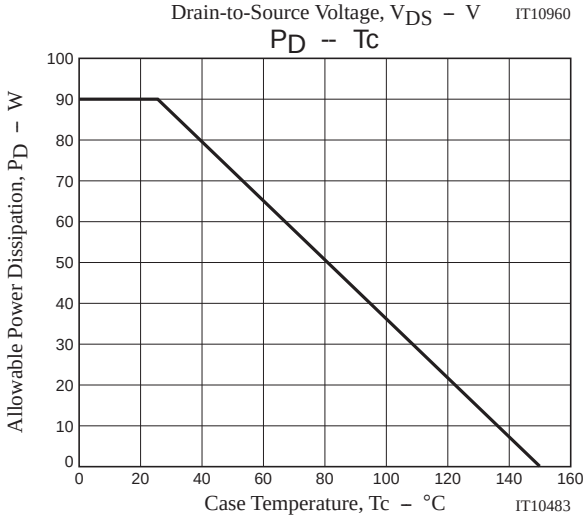

SW Time -- ID
VDD=30V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT10473

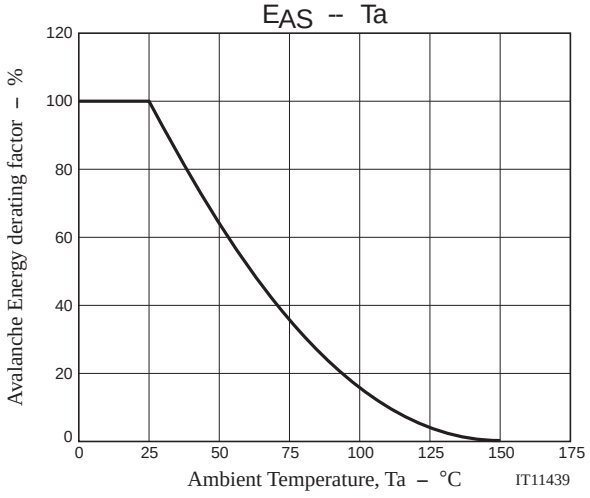

Ciss, Coss, Crss -- VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT10474


VGS -- Qg
VDS=30V
ID=100A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT10475


A S O
IDP=400A
ID=100A
≤10μs
10μs
100μs
1ms
10ms
100ms
DC operation
Operation in this area is limited by RDS(on).
Tc=25°C
Single pulse
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT10960


PD -- Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT11548


PD -- Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT10483


EAS -- Ta
Avalanche Energy derating factor – %
Ambient Temperature, Ta – °C
IT11439

Magazine Specification

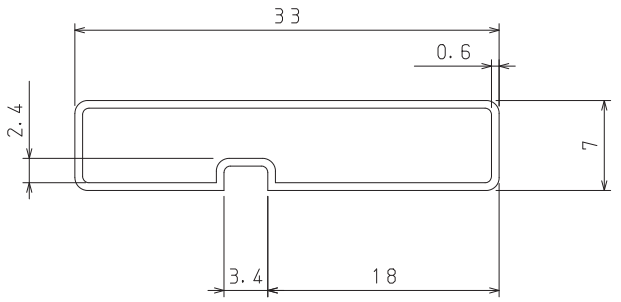
2SK4094-1E

1. Packing Format

Package Name	Maximum Number of devices contained (pcs)			Packing format	
	Magazine	Inner box	Outer box	Inner BOX	Outer BOX
TO-220-3L	50	1,000	4000	SPD-0V0001 20 magazines contained Dimensions:mm(external) 568×150×55	SPD-LV0010 4 inner boxes contained Dimensions:mm(external) 590x225x178

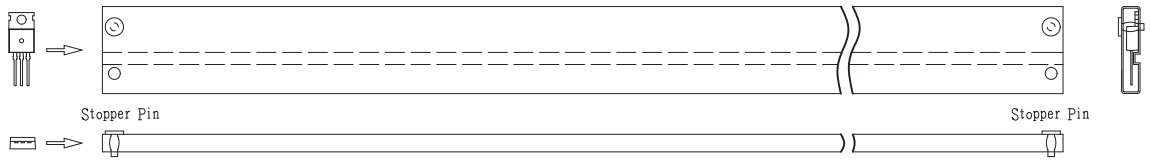
2. Magazine dimensions

(unit:mm)

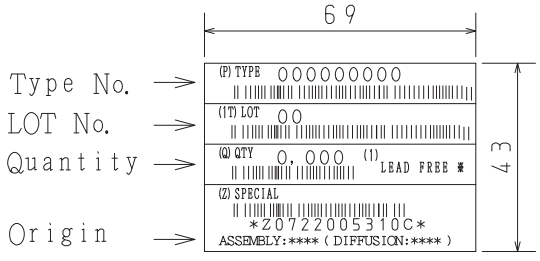


Tolerance=±0.2mm
Thickness=0.6+0.2/-0mm
Length =512.6±1mm
Material =PVC(Antistatic treatment)

3. Storage method to magazine

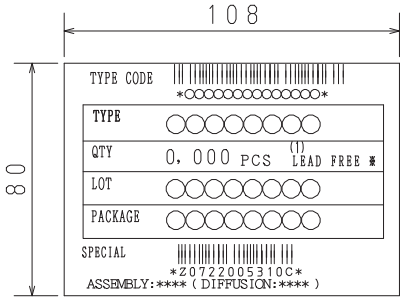


4. Inner box label (unit:mm)



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.



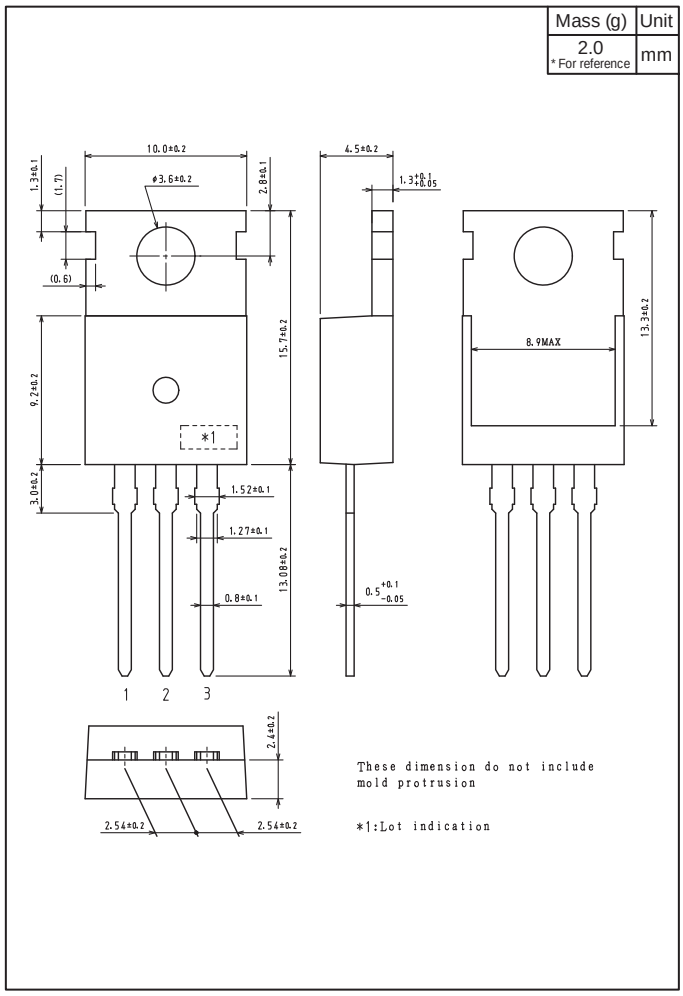
NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A

Outline Drawing

2SK4094-1E

Mass (g)	Unit
2.0 * For reference	mm



Note on usage : Since the 2SK4094 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.