Ordering number : EN8250B

SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

N-Channel Silicon MOSFET

2SK3748 — High-Voltage, High-Speed Switching Applications

Features

- Low ON-resistance, low input capacitance, ultrahigh-speed switching
- High reliability (Adoption of HVP process)
- Attachment workability is good by Mica-less package
- Avalanche resistance guarantee

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		1500	V
Gate-to-Source Voltage	V_{GSS}		±20	V
Drain Current (DC)	I_D*		4	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	8	A
Allowable Power Dissipation	P_D		3.0	W
		Tc=25°C	65	W
Channel Temperature	Tch		150	°C
Storage Temperature	Tstg		−55 to +150	°C
Avalanche Energy (Single Pulse) *1	E_{AS}		165	mJ
Avalanche Current *2	I_{AV}		4	A

*Shows chip capability

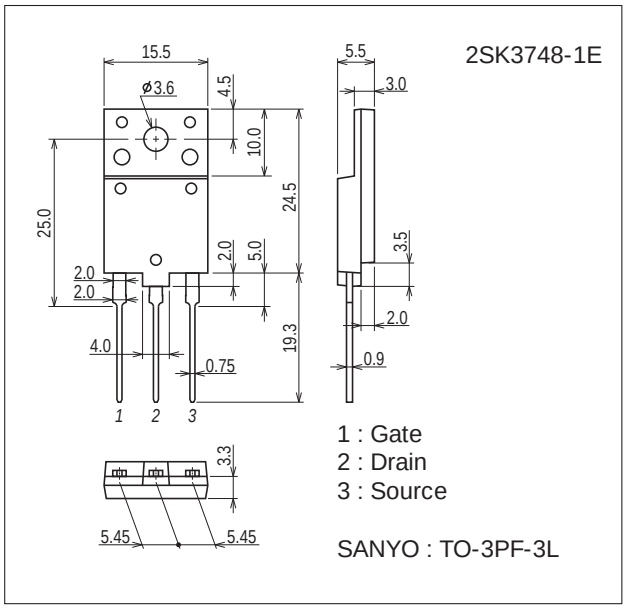
*1 V_{DD}=50V, L=20mH, I_{AV}=4A (Fig.1)

*2 L≤20mH, single pulse

Package Dimensions

unit : mm (typ)

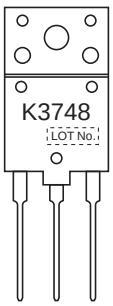
7538A-002



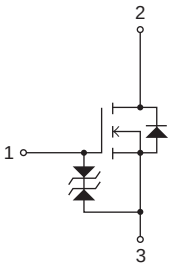
Product & Package Information

- Package : TO-3PF-3L
- JEITA, JEDEC : SC-94
- Minimum Packing Quantity : 30 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	1500			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=1200V, V_{GS}=0V			100	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	2.5		3.5	V
Forward Transfer Admittance	| yfs |	V_{DS}=20V, I_D=2A	1.7	2.8		S
Static Drain-to-Source On-State Resistance	R_{DS}(on)	I_D=2A, V_{GS}=10V		5	7	Ω
Input Capacitance	Ciss	V_{DS}=30V, f=1MHz		790		pF
Output Capacitance	Coss			140		pF
Reverse Transfer Capacitance	Crss			70		pF
Turn-ON Delay Time	t_d(on)	See Fig.2		17		ns
Rise Time	t_r			75		ns
Turn-OFF Delay Time	t_d(off)			360		ns
Fall Time	t_f			116		ns
Total Gate Charge	Qg	V_{DS}=200V, V_{GS}=10V, I_D=4A		80		nC
Gate-to-Source Charge	Qgs			6.4		nC
Gate-to-Drain “Miller” Charge	Qgd			36		nC
Diode Forward Voltage	V_{SD}	I_S=4A, V_{GS}=0V		0.94	1.2	V
Reverse Recovery Time	t_{rr}	I_S=4A, V_{GS}=0V, dis/dt=100A/μs		340		ns

Fig.1 Avalanche Resistance Test Circuit

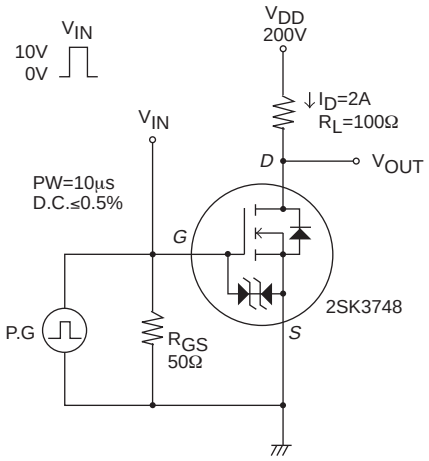
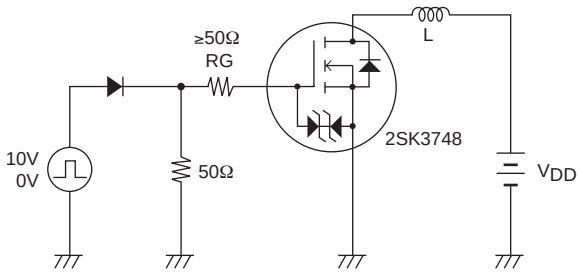
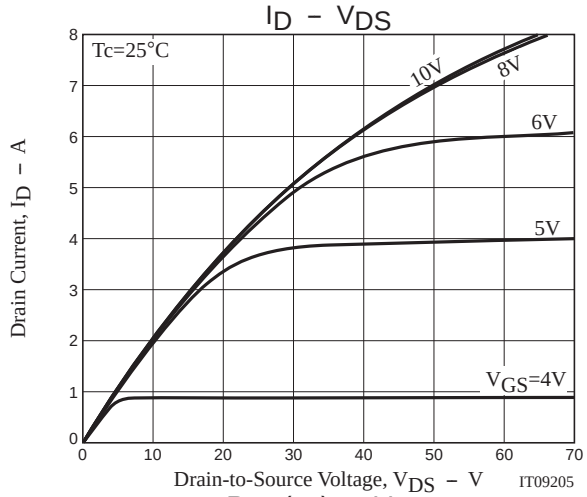


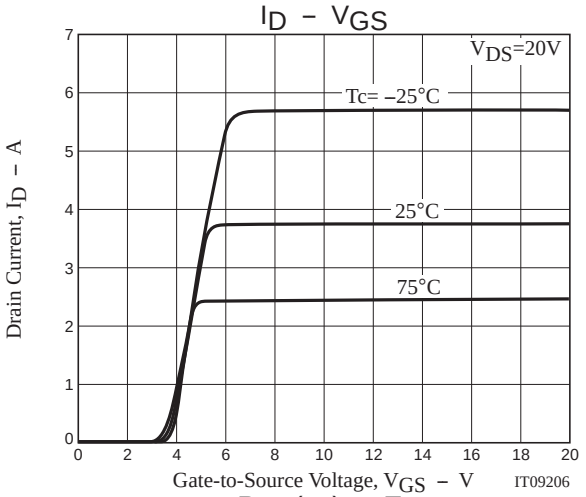
Fig.2 Switching Time Test Circuit

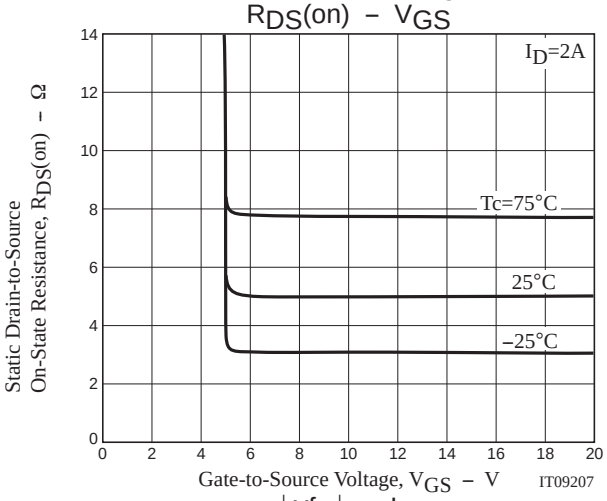


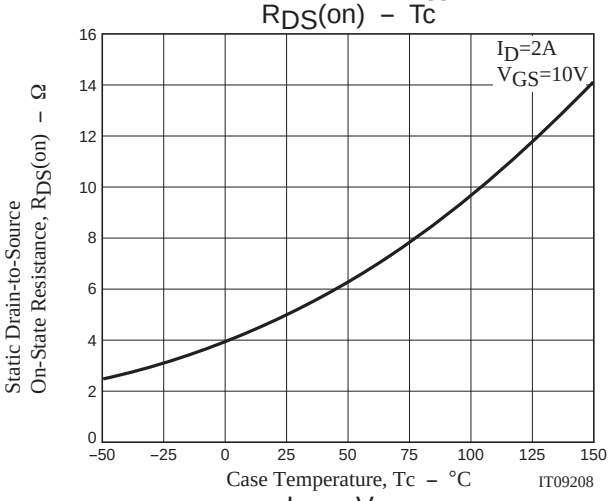
Ordering Information

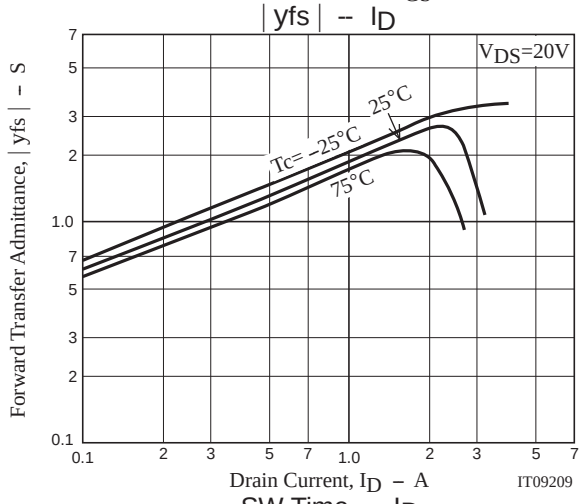
Device	Package	Shipping	memo
2SK3748-1E	TO-3PF-3L	30pcs./magazine	Pb Free

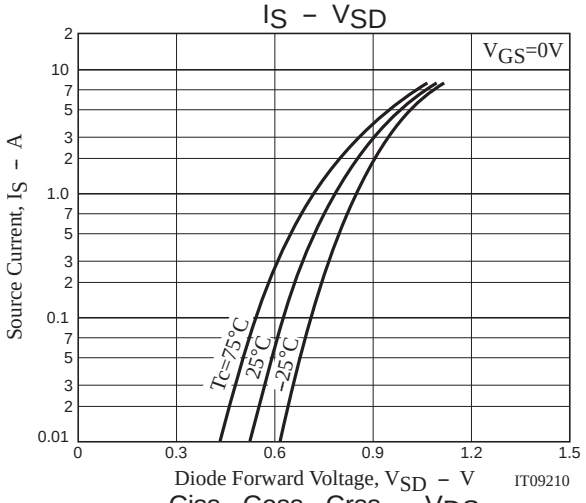

ID – VDS
Tc=25°C
10V
8V
6V
5V
VGS=4V
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V
IT09205

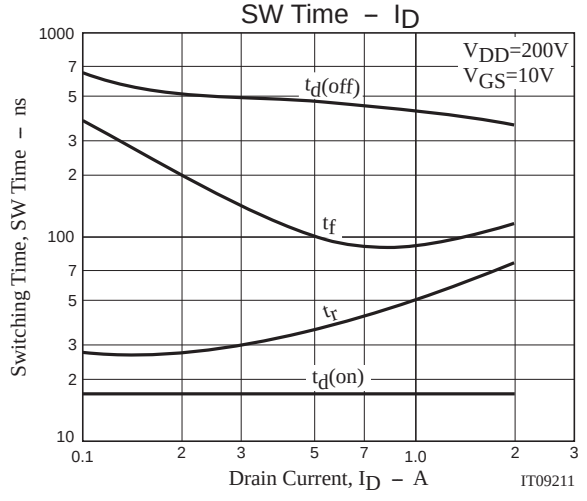

ID – VGS
VDS=20V
Tc= –25°C
25°C
75°C
Drain Current, ID – A
Gate-to-Source Voltage, VGS – V
IT09206

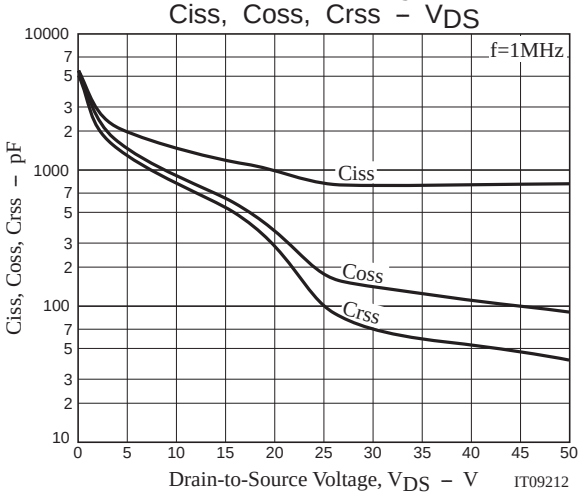

RDS(on) – VGS
ID=2A
Tc=75°C
25°C
–25°C
Static Drain-to-Source
On-State Resistance, RDS(on) – Ω
Gate-to-Source Voltage, VGS – V
IT09207

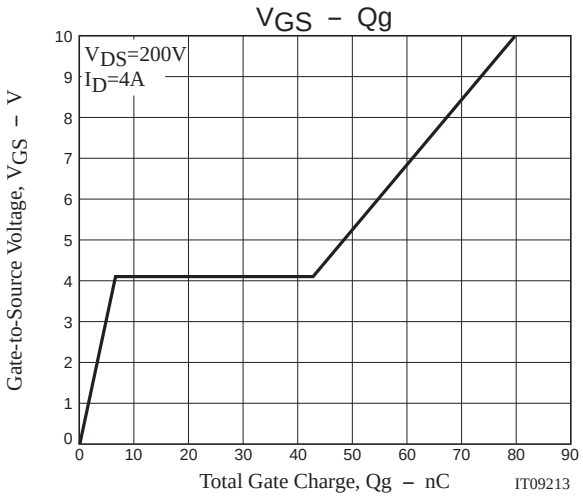

RDS(on) – Tc
ID=2A
VGS=10V
Static Drain-to-Source
On-State Resistance, RDS(on) – Ω
Case Temperature, Tc – °C
IT09208

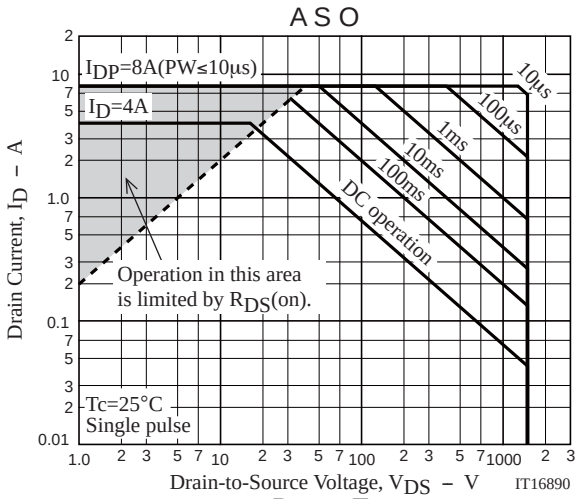

| yfs | – ID
VDS=20V
25°C
Tc= –25°C
75°C
Forward Transfer Admittance, | yfs | – S
Drain Current, ID – A
IT09209

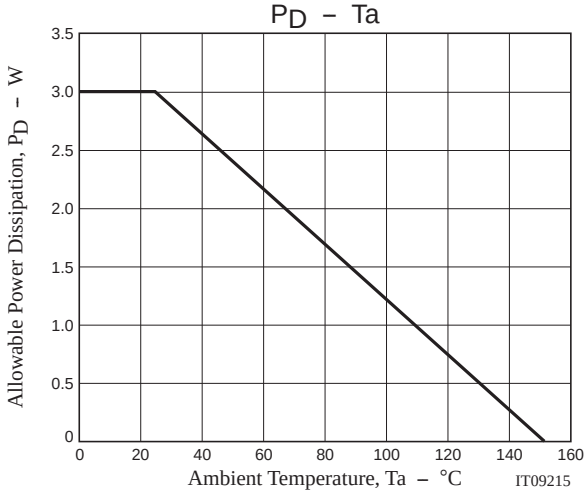

IS – VSD
VGS=0V
Tc=75°C
25°C
–25°C
Source Current, IS – A
Diode Forward Voltage, VSD – V
IT09210

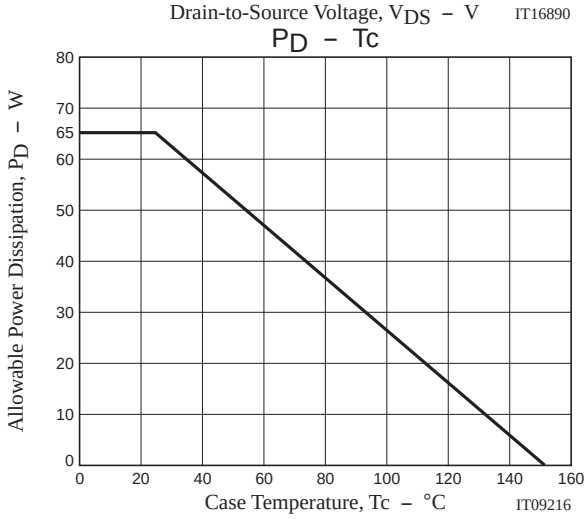

SW Time – ID
VDD=200V
VGS=10V
td(off)
tf
tr
td(on)
Switching Time, SW Time – ns
Drain Current, ID – A
IT09211


Ciss, Coss, Crss – VDS
f=1MHz
Ciss
Coss
Crss
Ciss, Coss, Crss – pF
Drain-to-Source Voltage, VDS – V
IT09212


VGS – Qg
VDS=200V
ID=4A
Gate-to-Source Voltage, VGS – V
Total Gate Charge, Qg – nC
IT09213


A S O
IDP=8A(PW≤10μs)
ID=4A
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
IT16890


PD – Ta
Allowable Power Dissipation, PD – W
Ambient Temperature, Ta – °C
IT09215


PD – Tc
Allowable Power Dissipation, PD – W
Case Temperature, Tc – °C
IT09216

Magazine Specification

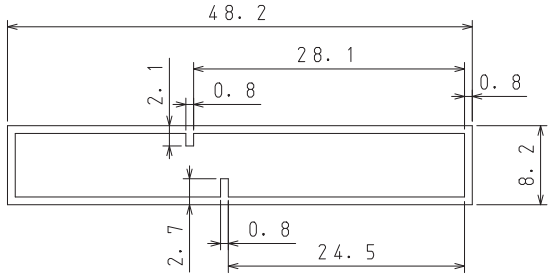
2SK3748-1E

1. Packing Format

Package Name	Maximum Number of devices contained (pcs)			Packing format	
	Magazine	Inner box	Outer box	Inner BOX	Outer BOX
TO-3PF-3L	30	360	1440	SPD-0V0001 12 magazines contained Dimensions:mm(external) 568×150×55	SPD-LV0010 4 inner boxes contained Dimensions:mm(external) 590x225x178

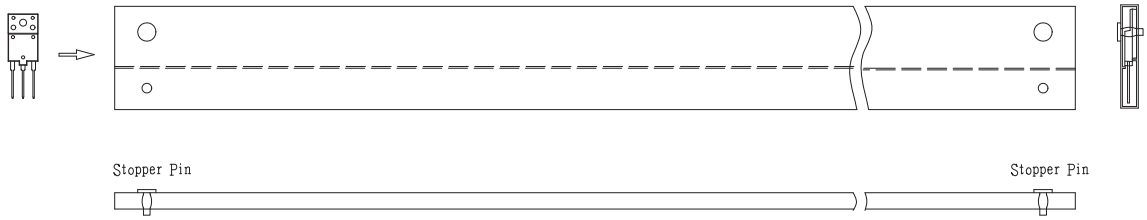
2. Magazine dimensions

(unit:mm)

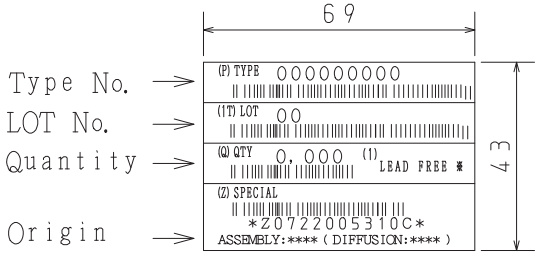


Tolerance=±0.2mm
Thickness=0.8±0.2mm
Length =508.0±1mm
Material =PVC or PET
(Antistatic treatment)

3. Storage method to magazine

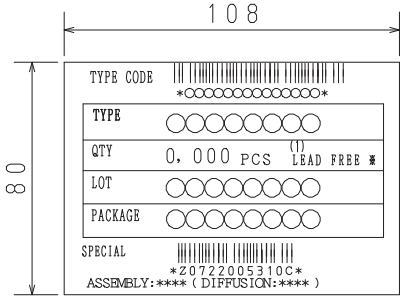


4. Inner box label (unit:mm)



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.

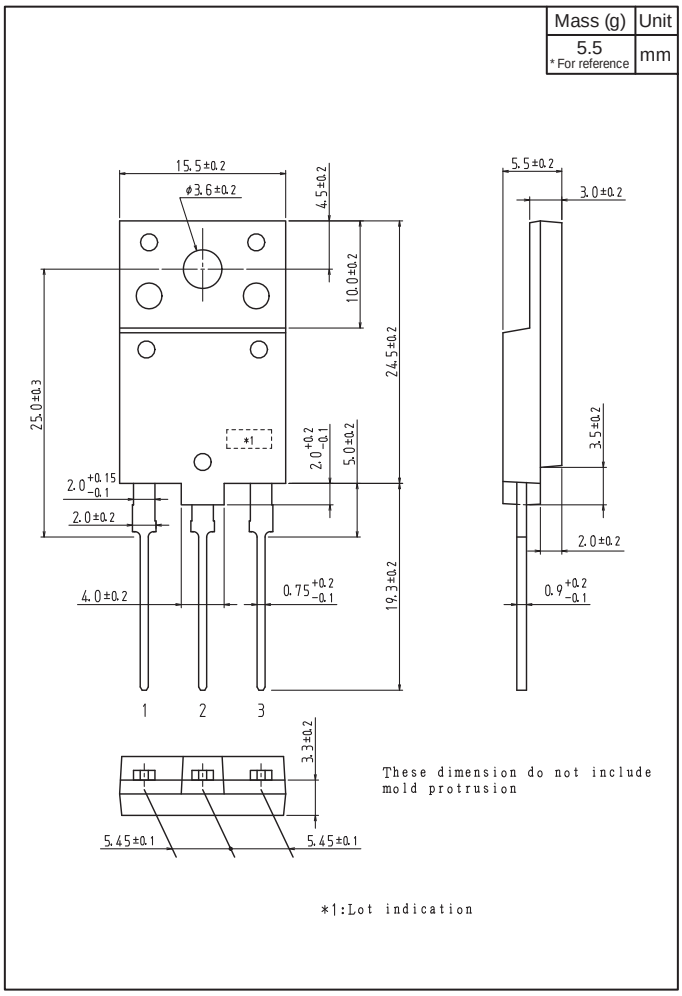


NOTE (1)
The LEAD FREE ※ description shows that the surface treatment of the terminal is lead free.

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A

Outline Drawing

2SK3748-1E



Note on usage : Since the 2SK3748 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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