



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

## 2SK3748 — N-Channel Silicon MOSFET 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 <sub>DSS</sub>		1500	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±20	V
Drain Current (DC)	I <sub>D</sub> <sup>*</sup>		4	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycles≤1%	8	A
Allowable Power Dissipation	P <sub>D</sub>		3.0	W
		T <sub>c</sub> =25°C	65	W
Channel Temperature	T <sub>ch</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C
Avalanche Energy (Single Pulse) *1	E <sub>AS</sub>		165	mJ
Avalanche Current *2	I <sub>AV</sub>		4	A

\*Shows chip capability

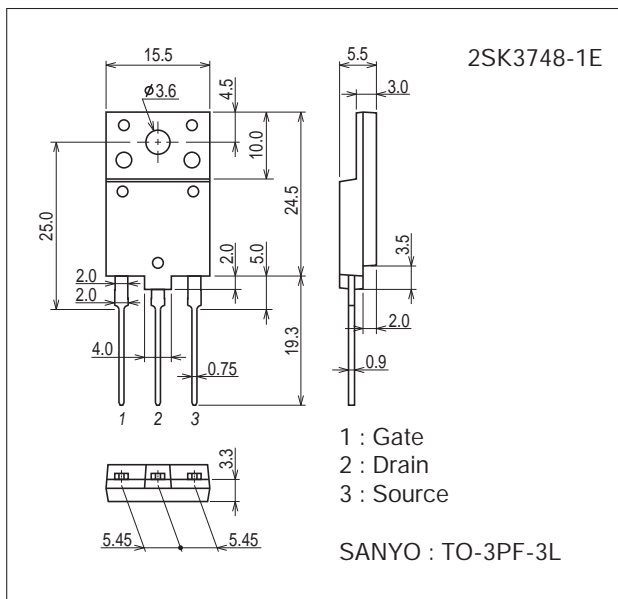
\*1 V<sub>DD</sub>=50V, L=20mH, I<sub>AV</sub>=4A (Fig.1)

\*2 L≤20mH, single pulse

### Package Dimensions

unit : mm (typ)

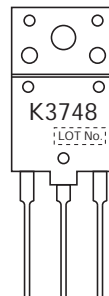
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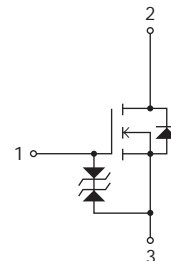
### Product & Package Information

- Package : TO-3PF-3L
- JEITA, JEDEC : SC-94
- Minimum Packing Quantity : 30 pcs./magazine

### Marking



### Electrical Connection



# 2SK3748

## 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	$\mu A$	
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=16V, V_{DS}=0V$			$\pm 10$	$\mu A$	
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10V, I_D=1mA$	2.5		3.5	V	
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=20V, I_D=2A$	1.7	2.8		S	
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	$I_D=2A, V_{GS}=10V$		5	7	$\Omega$	
Input Capacitance	$C_{iss}$	$V_{DS}=30V, f=1MHz$		790		pF	
Output Capacitance	$C_{oss}$				140		pF
Reverse Transfer Capacitance	$C_{rss}$				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	$Q_g$	$V_{DS}=200V, V_{GS}=10V, I_D=4A$		80		nC	
Gate-to-Source Charge	$Q_{gs}$			6.4		nC	
Gate-to-Drain "Miller" Charge	$Q_{gd}$			36		nC	
Diode Forward Voltage	$V_{SD}$	$I_S=4A, V_{GS}=0V$		0.94	1.2	V	
Reverse Recovery Time	$t_{rr}$	$I_S=4A, V_{GS}=0V, dis/dt=100A/\mu s$		340		ns	

Fig.1 Avalanche Resistance Test Circuit

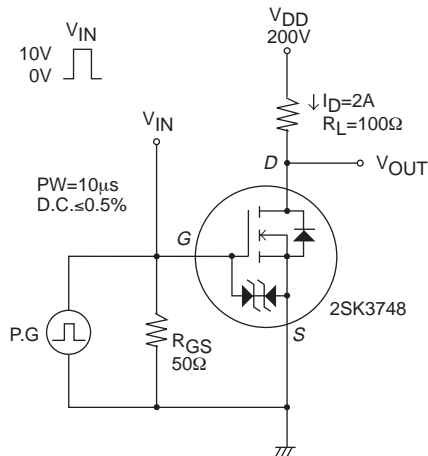
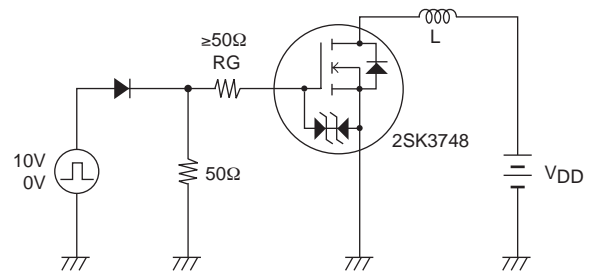
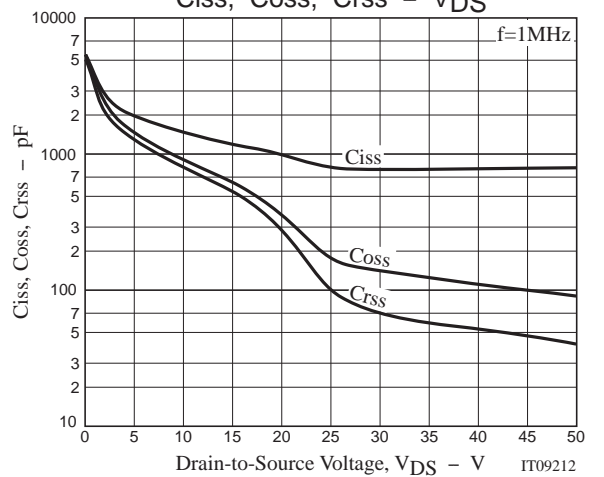
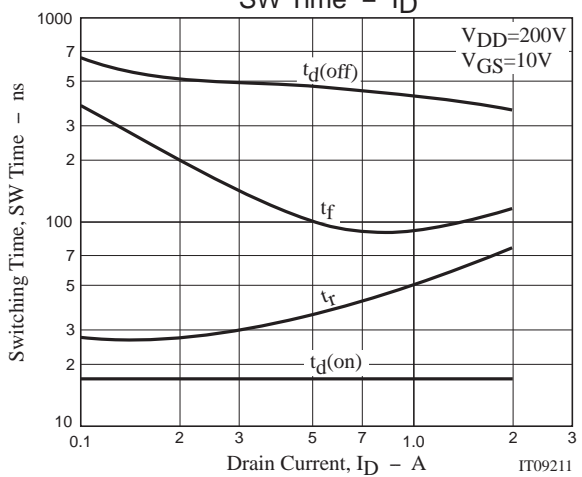
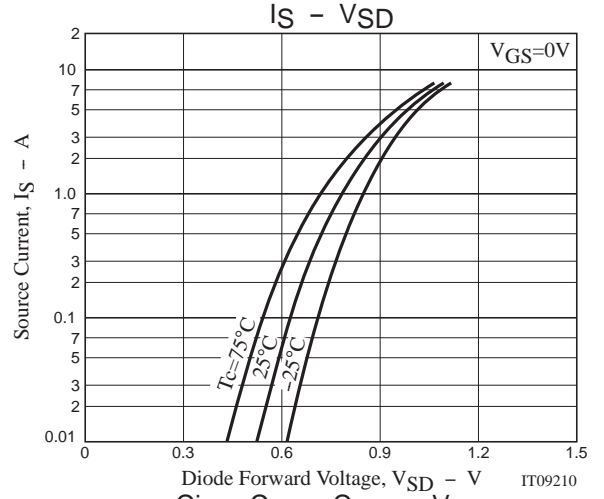
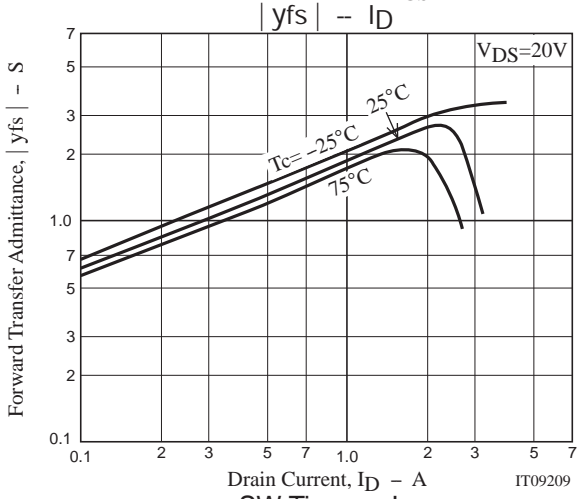
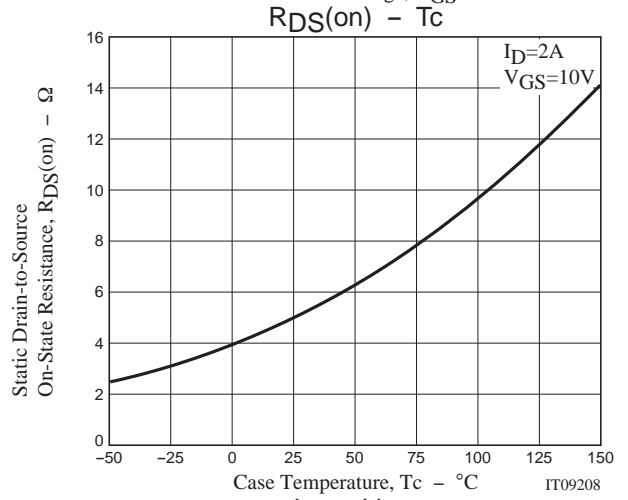
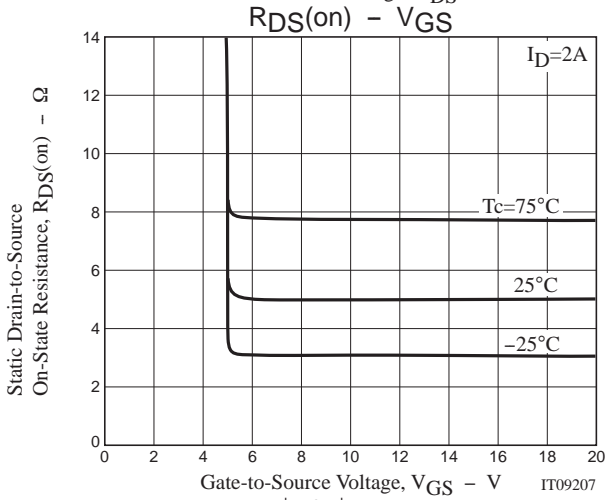
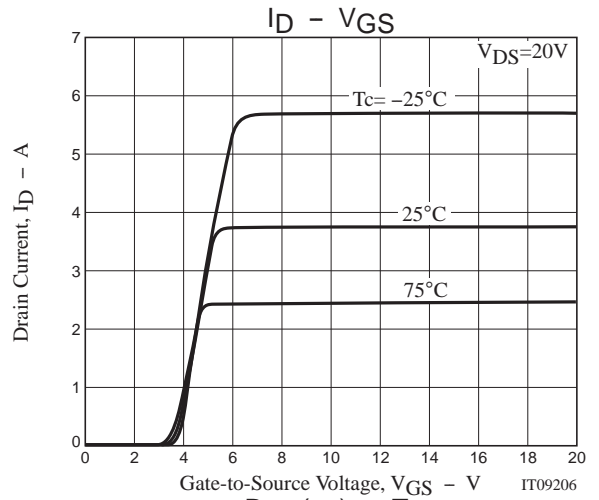
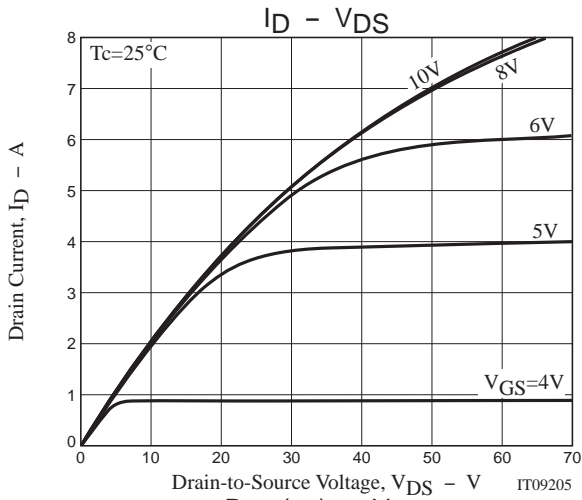


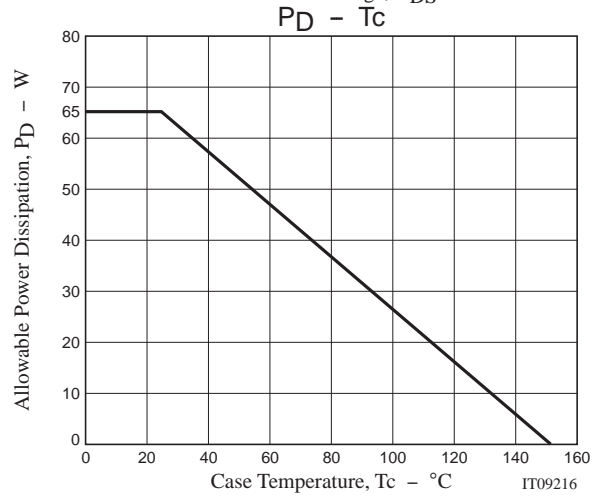
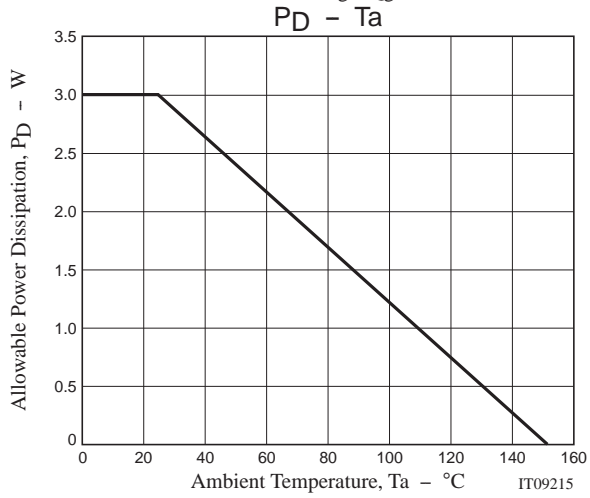
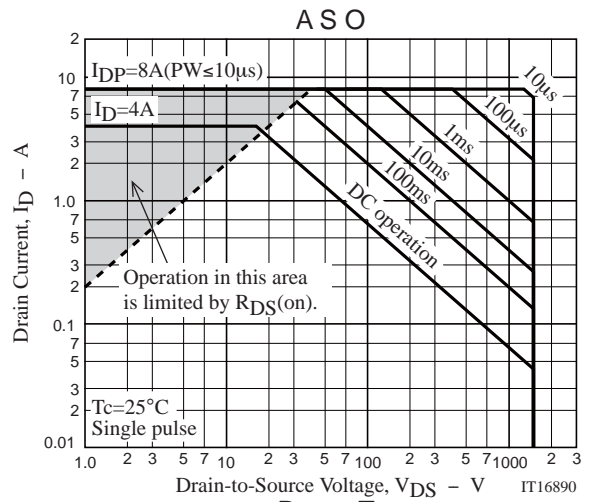
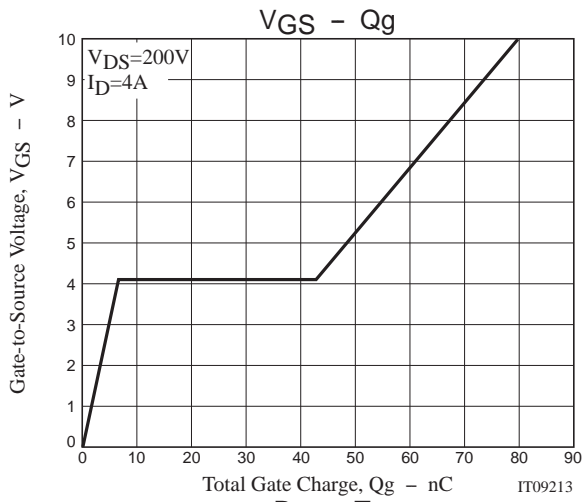
Fig.2 Switching Time Test Circuit



## Ordering Information

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





Magazine Specification

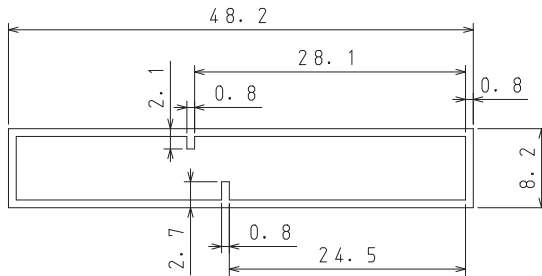
2SK3748-1E

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) 590×225×178

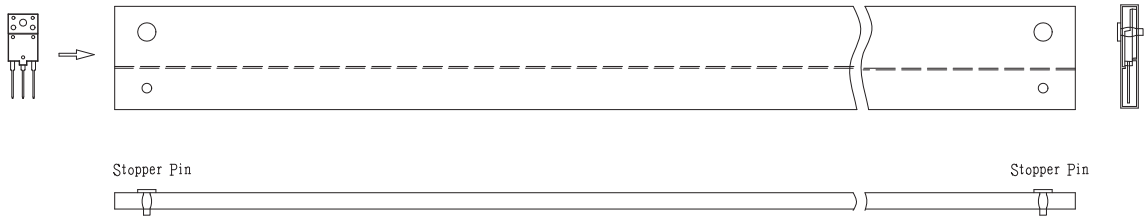
2. Magazine dimensions

(unit:mm)



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

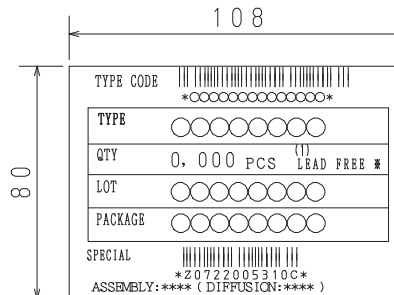
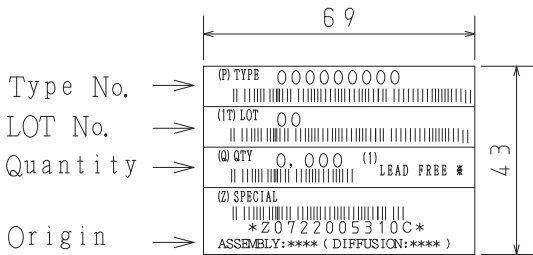
3. Storage method to magazine



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.



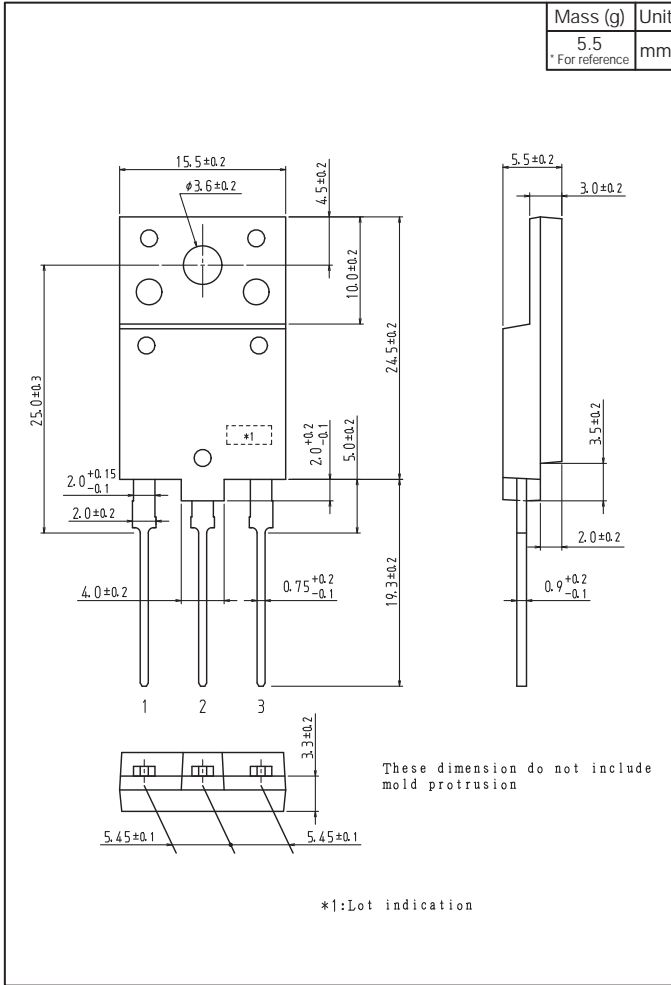
NOTE (1)

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.

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