



# 2SK3748

## N-Channel Power MOSFET 1500V, 4A, 7Ω, TO-3PF-3L

ON Semiconductor®

<http://onsemi.com>

### 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> *		4	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤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)

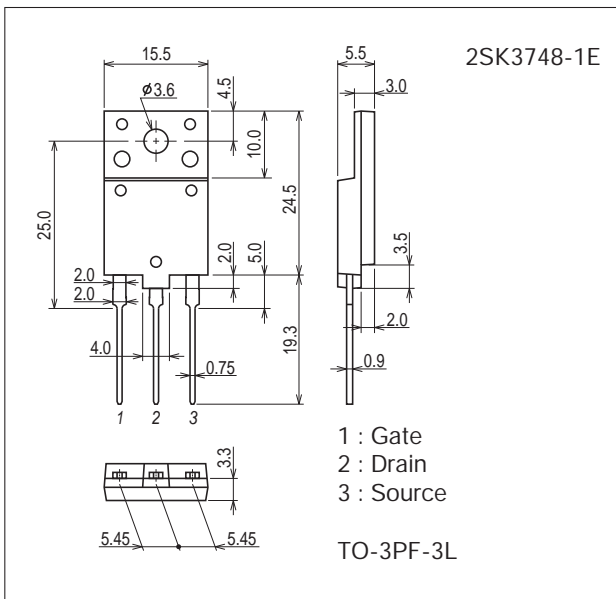
\*2 L≤20mH, single pulse

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

### Package Dimensions

unit : mm (typ)

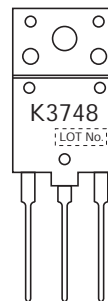
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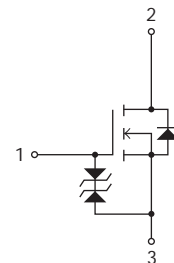
### Product & Package Information

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

### Marking



### Electrical Connection



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

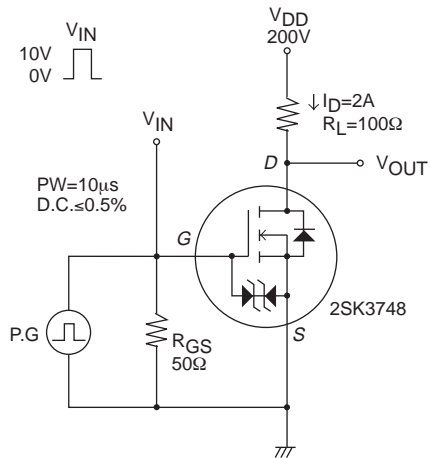
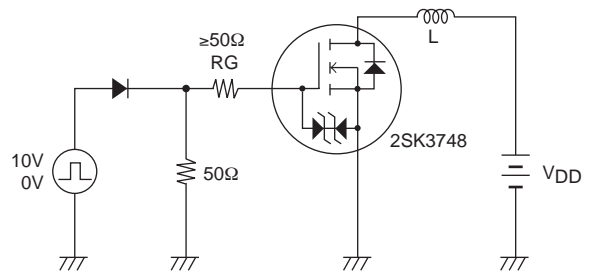
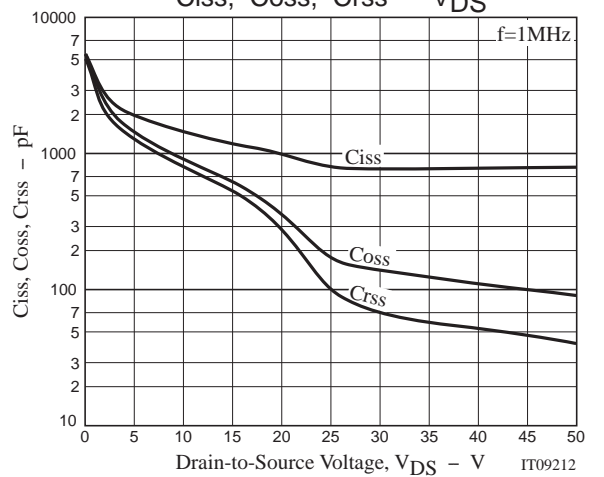
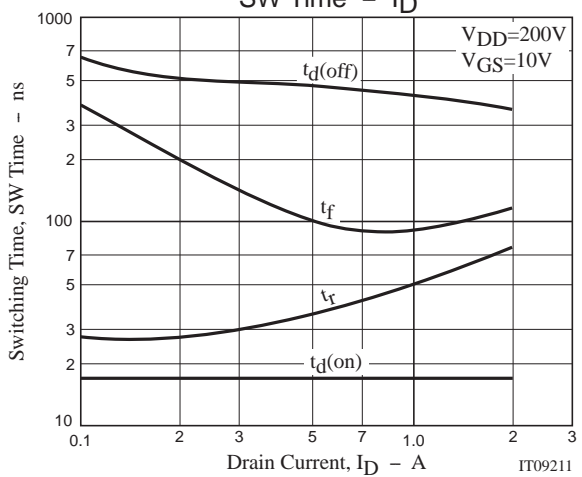
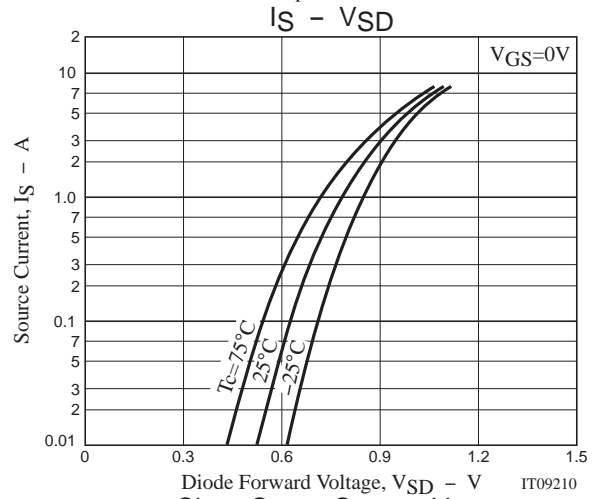
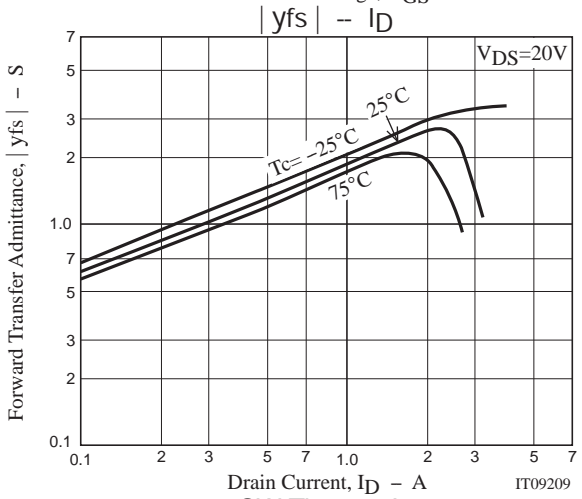
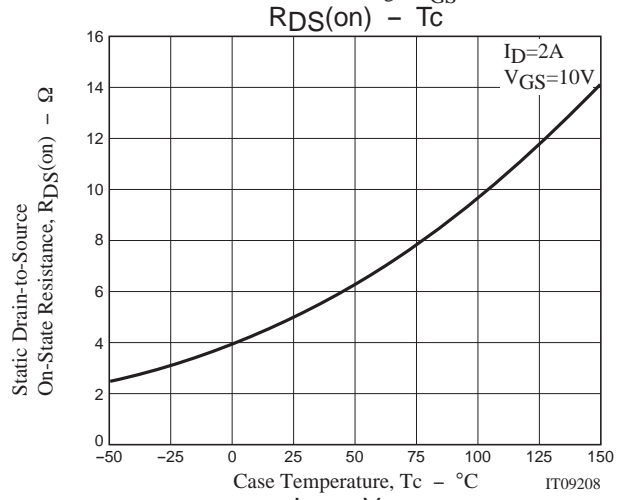
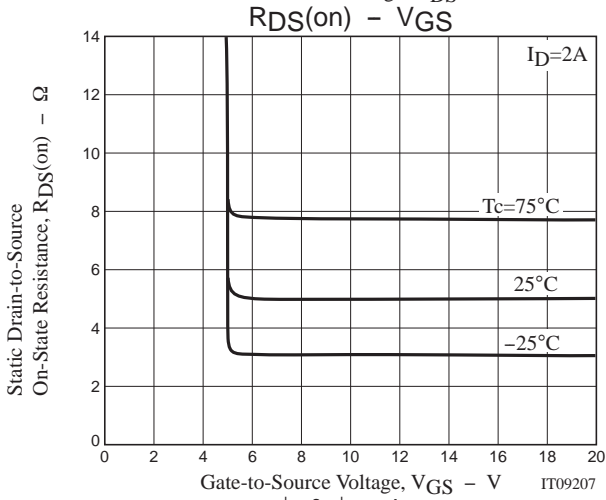
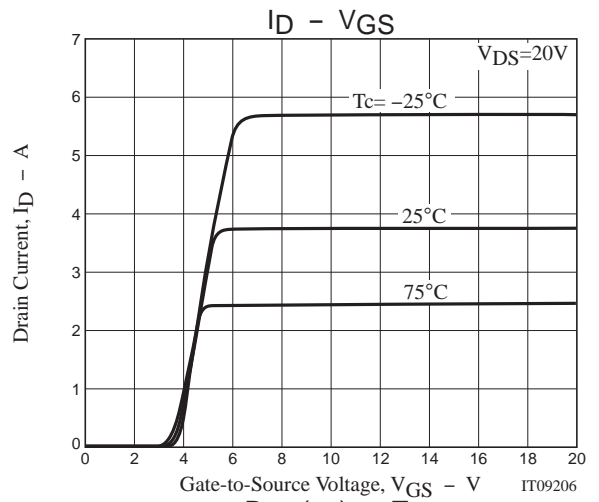
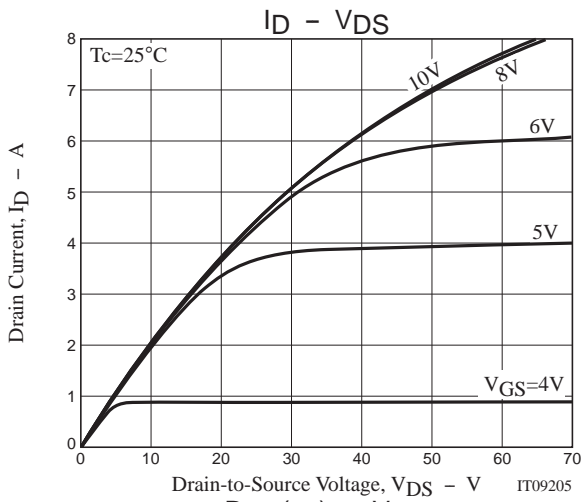


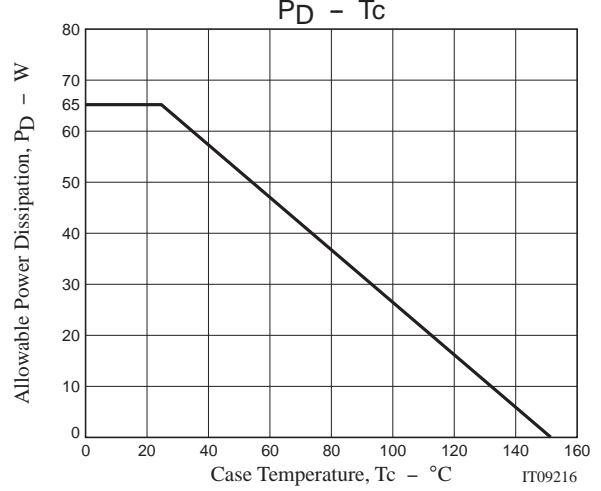
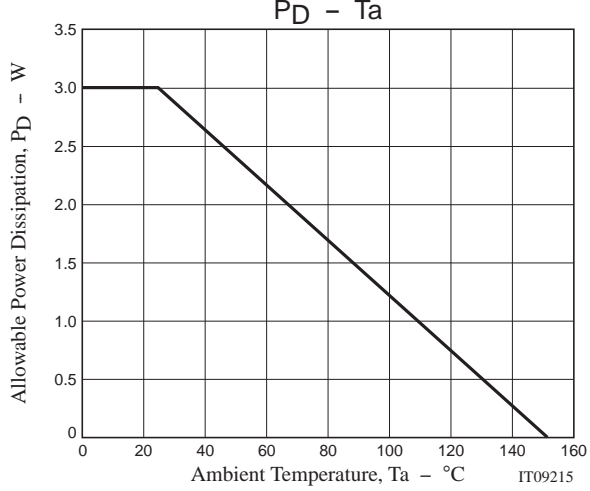
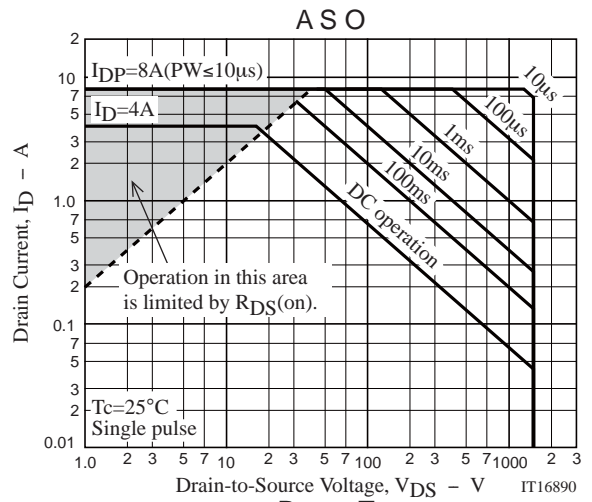
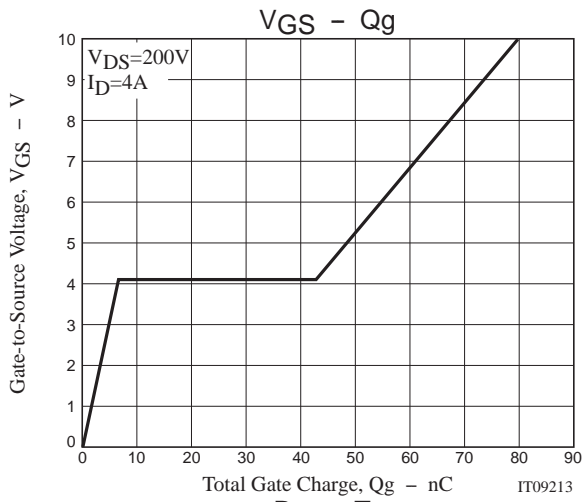
Fig.2 Switching Time Test Circuit



Ordering Information

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





Magazine Specification

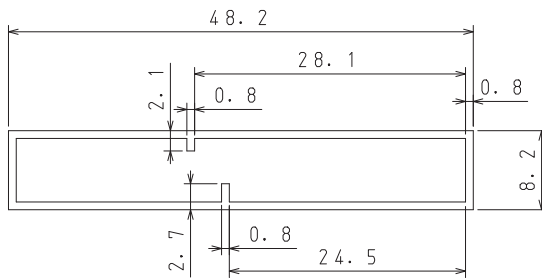
2SK3748-1E

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

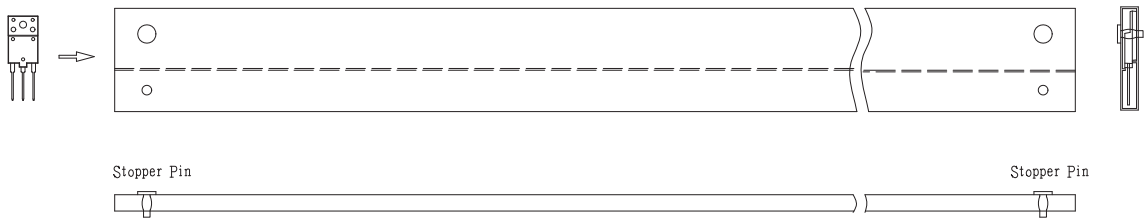
2. Magazine dimensions

(unit:mm)



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

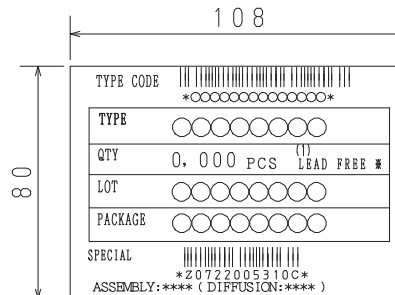
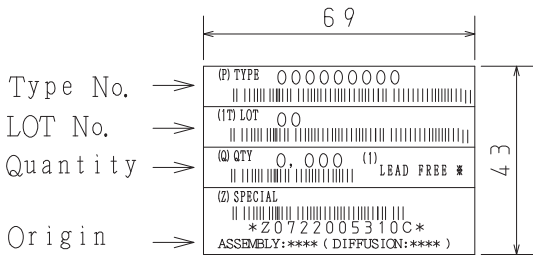
3. Storage method to magazine



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)

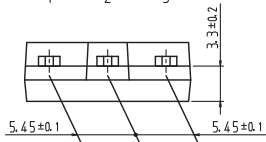
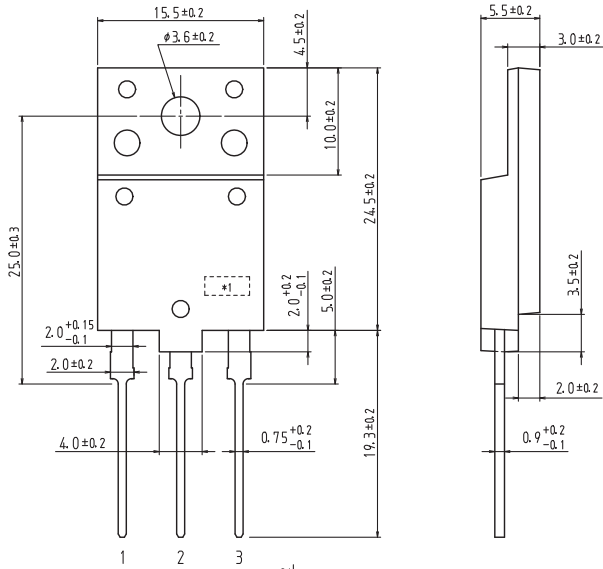
The LEAD FREE \* description shows that the surface treatment of the terminal is lead free,

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A

Outline Drawing

2SK3748-1E

Mass (g)	Unit
5.5	mm
* For reference	



These dimension do not include mold protrusion

\*|: Lot indication

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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