



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

## 2SK3746 — 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)
- 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>		2	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	4	A
Allowable Power Dissipation	P <sub>D</sub>		2.5	W
		T <sub>c</sub> =25°C	110	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>		41	mJ
Avalanche Current *2	I <sub>AV</sub>		2	A

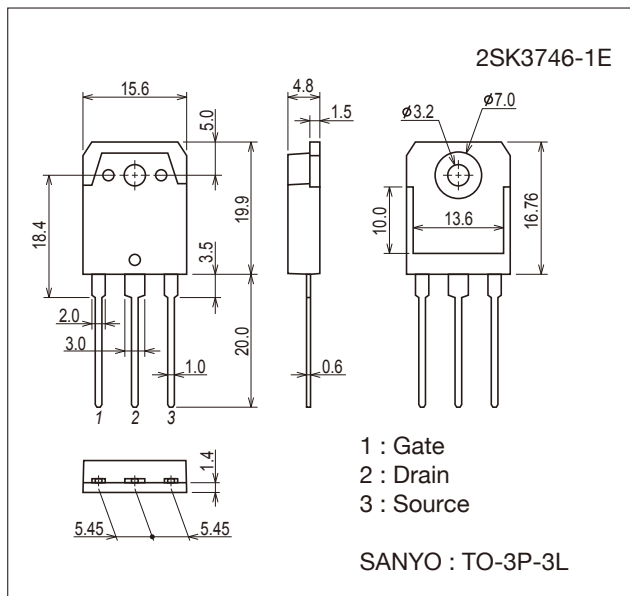
\*1 V<sub>DD</sub>=50V, L=20mH, I<sub>AV</sub>=2A (Fig.1)

\*2 L≤20mH, single pulse

### Package Dimensions

unit : mm (typ)

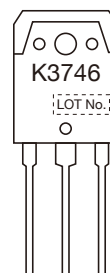
7539-002



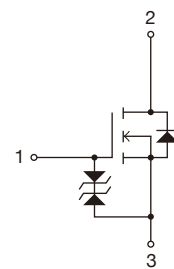
### Product & Package Information

- Package : TO-3P-3L
- JEITA, JEDEC : SC-65, TO-247, SOT-199
- Minimum Packing Quantity : 30 pcs./magazine

### Marking



### Electrical Connection

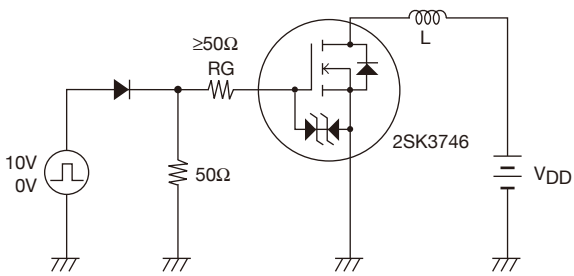


# 2SK3746

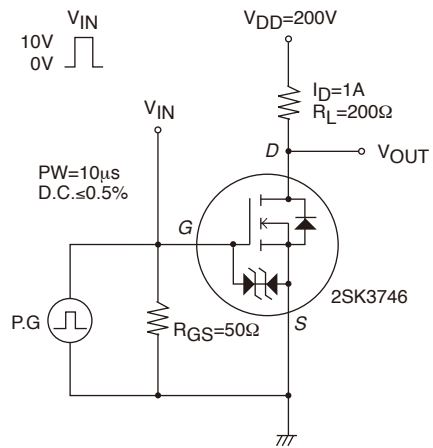
## Electrical Characteristics at Ta=25°C

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} $	$V_{DS}=20V, I_D=1A$	0.7	1.4		S	
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	$I_D=1A, V_{GS}=10V$		10	13	$\Omega$	
Input Capacitance	$C_{iss}$	$V_{DS}=30V, f=1MHz$		380		pF	
Output Capacitance	$C_{oss}$				70		pF
Reverse Transfer Capacitance	$C_{rss}$				40		pF
Turn-ON Delay Time	$t_{d(on)}$	See Fig.2		12		ns	
Rise Time	$t_r$			37		ns	
Turn-OFF Delay Time	$t_{d(off)}$			152		ns	
Fall Time	$t_f$			59		ns	
Total Gate Charge	$Q_g$	$V_{DS}=200V, V_{GS}=10V, I_D=2A$		37.5		nC	
Gate-to-Source Charge	$Q_{gs}$			2.7		nC	
Gate-to-Drain "Miller" Charge	$Q_{gd}$			20		nC	
Diode Forward Voltage	$V_{SD}$	$I_S=2A, V_{GS}=0V$		0.88	1.2	V	

**Fig.1 Avalanche Resistance Test Circuit**

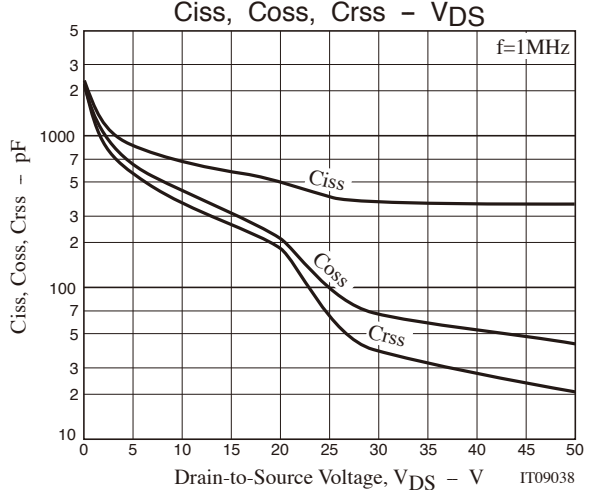
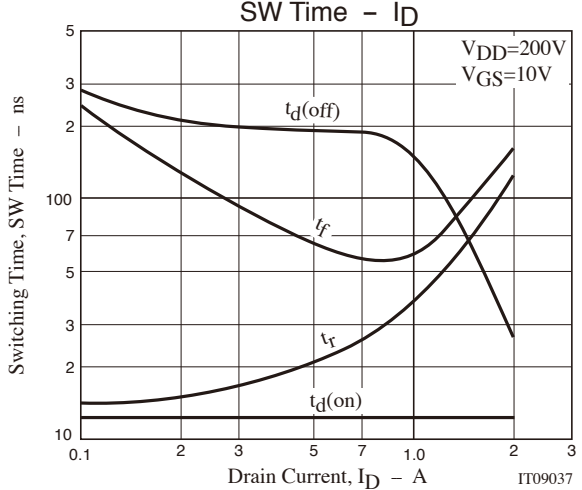
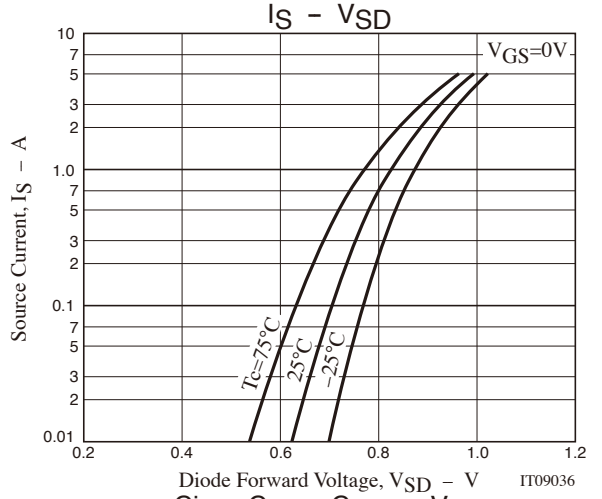
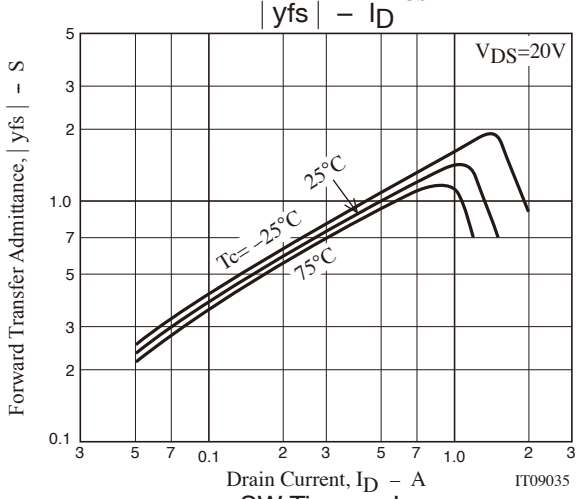
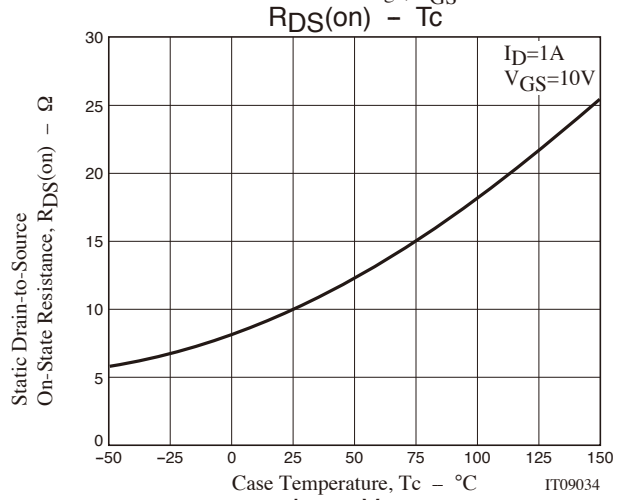
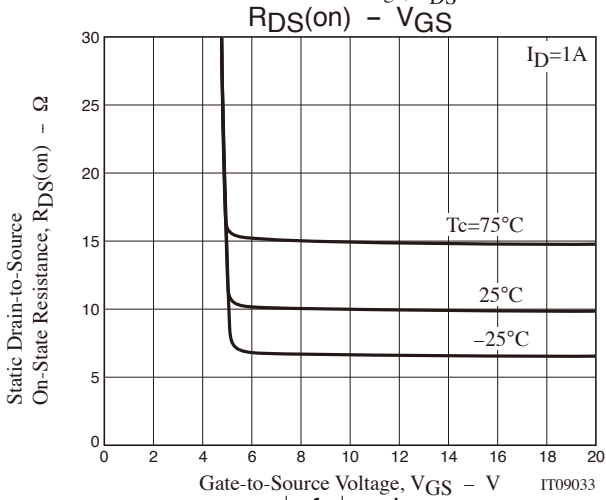
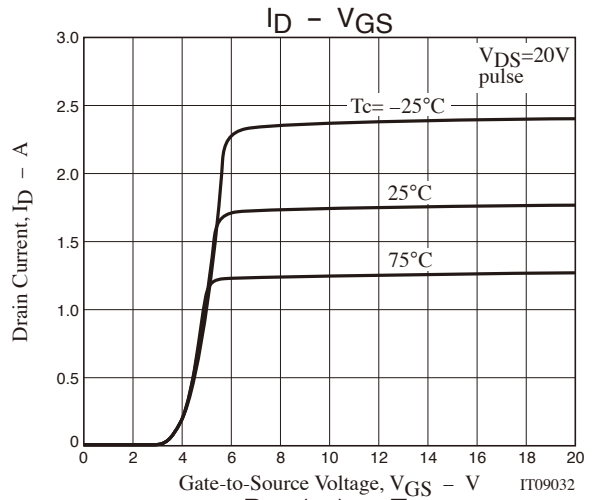
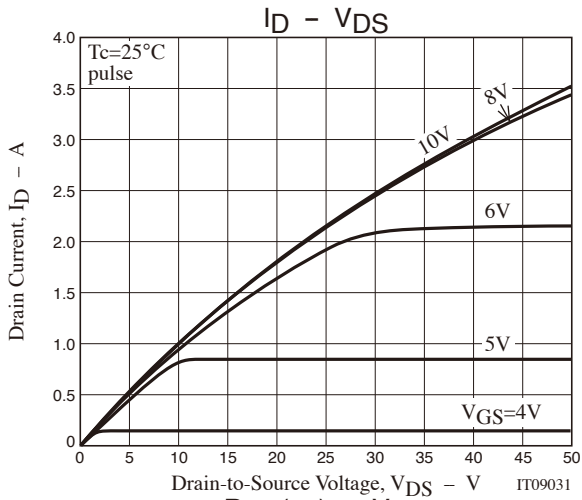


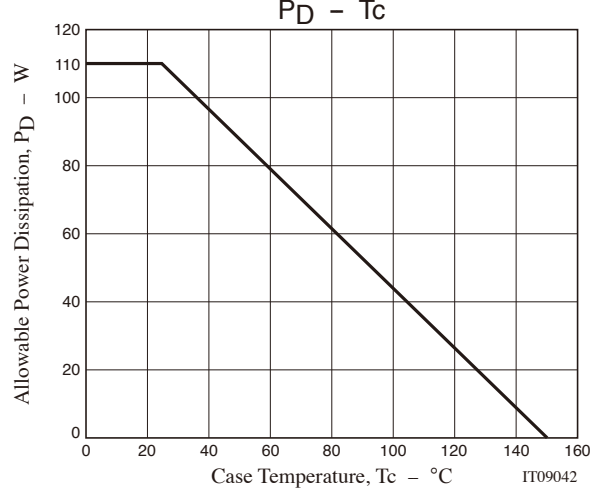
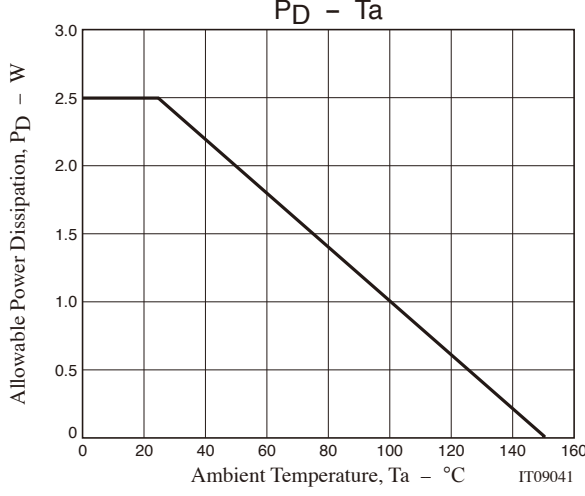
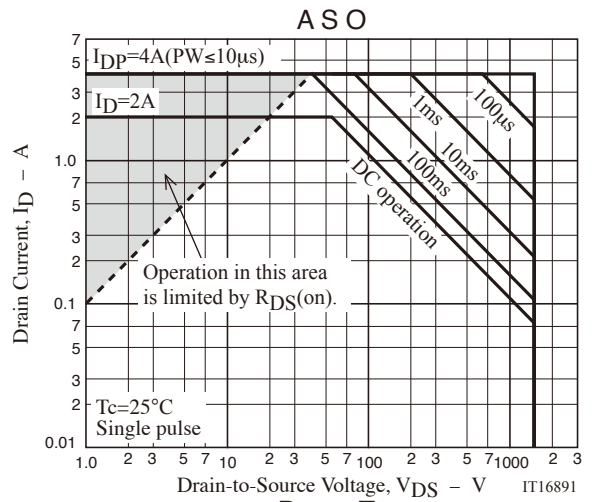
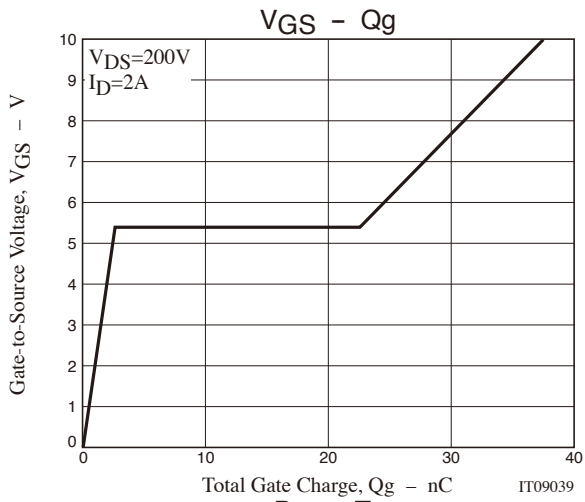
**Fig.2 Switching Time Test Circuit**



## Ordering Information

Device	Package	Shipping	memo
2SK3746-1E	TO-3P-3L	30pcs./magazine	Pb Free





Magazine Specification

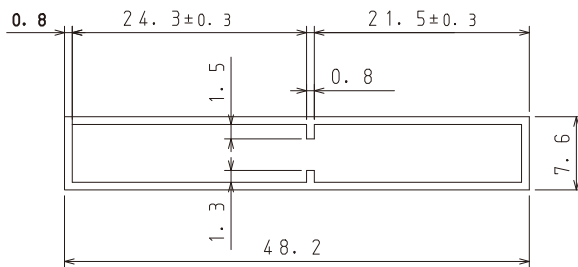
2SK3746-1E

1. Packing Format

Package Name	Maximum Number of devices contained (pcs)			Packing format	
	Magazine	Inner box	Outer box	Inner BOX	Outer BOX
TO-3P-3L	30	450	1800	SPD-0V0001 15 magazines contained Dimensions:mm (external) 568×150×55	SPD-LV0010 4 inner boxes contained Dimensions:mm (external) 590×225×178

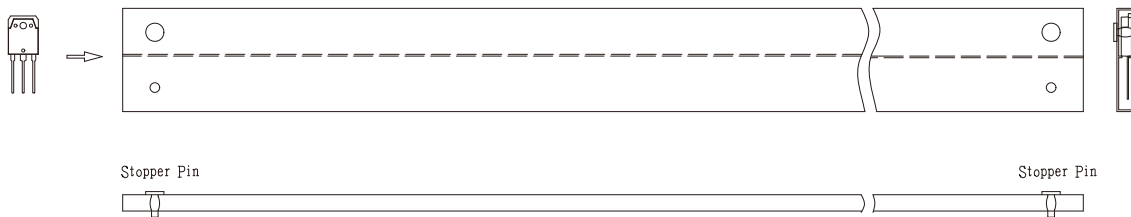
2. Magazine dimensions

(unit:mm)



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

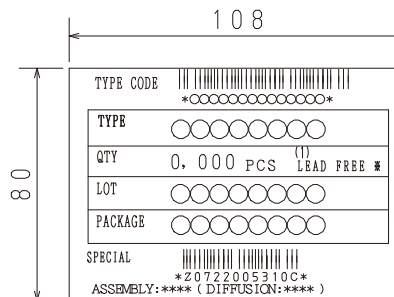
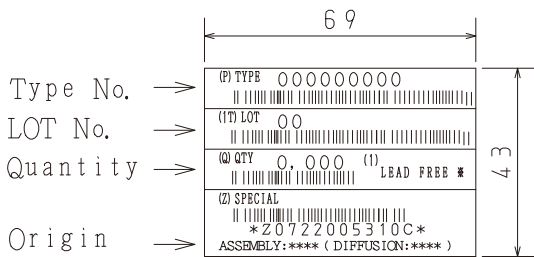
3. Storage method to magazine



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)

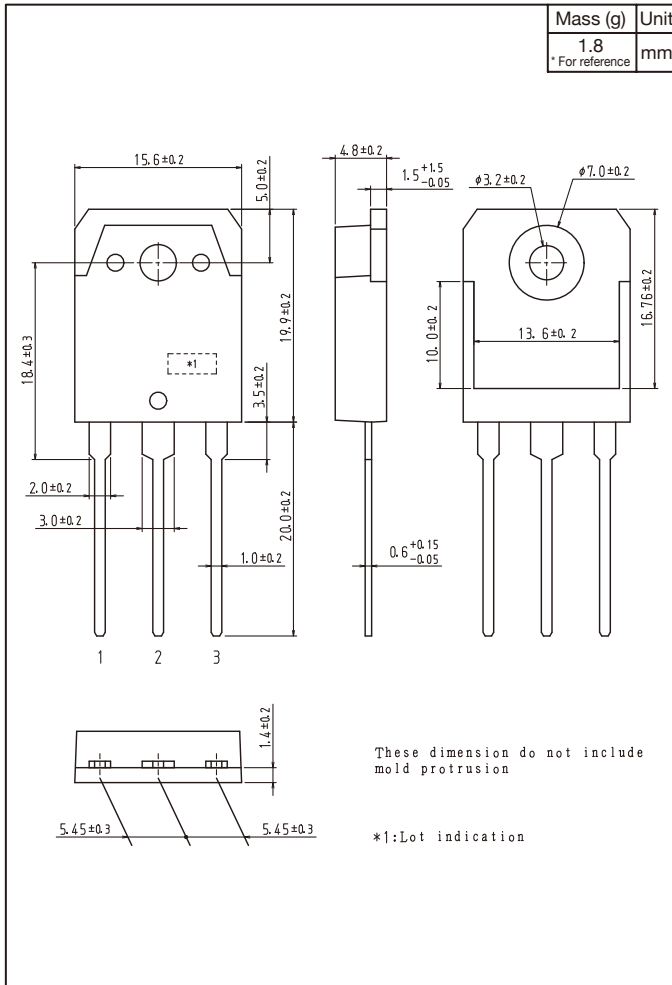
The LEAD FREE \* description shows that the surface treatment of the terminal is lead free,

Label	JEITA Phase
LEAD FREE 3	JEITA Phase 3A

# 2SK3746

## Outline Drawing

2SK3746-1E



Note on usage : Since the 2SK3746 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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