



SANYO Semiconductors

## DATA SHEET

# 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  $T_a=25^\circ\text{C}$ 

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	$V_{DS}$		1500	V
Gate-to-Source Voltage	$V_{GS}$		$\pm 20$	V
Drain Current (DC)	$I_D$		2	A
Drain Current (Pulse)	$I_{DP}$	$PW \leq 10\mu\text{s}$ , duty cycle $\leq 1\%$	4	A
Allowable Power Dissipation	$P_D$		2.5	W
		$T_c=25^\circ\text{C}$	110	W
Channel Temperature	$T_{ch}$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$
Avalanche Energy (Single Pulse) *1	$E_{AS}$		42	mJ
Avalanche Current *2	$I_{AV}$		2	A

\*1  $V_{DD}=99\text{V}$ ,  $L=20\text{mH}$ ,  $I_{AV}=2\text{A}$ \*2  $L \leq 20\text{mH}$ , Single pulseElectrical Characteristics at  $T_a=25^\circ\text{C}$ 

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}$ , $V_{GS}=0\text{V}$	1500			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=1200\text{V}$ , $V_{GS}=0\text{V}$			100	$\mu\text{A}$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 16\text{V}$ , $V_{DS}=0\text{V}$			$\pm 10$	$\mu\text{A}$
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10\text{V}$ , $I_D=1\text{mA}$	2.5		3.5	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=20\text{V}$ , $I_D=1\text{A}$	0.7	1.4		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	$I_D=1\text{A}$ , $V_{GS}=10\text{V}$		10	13	$\Omega$

Marking : K3746

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## 2SK3746

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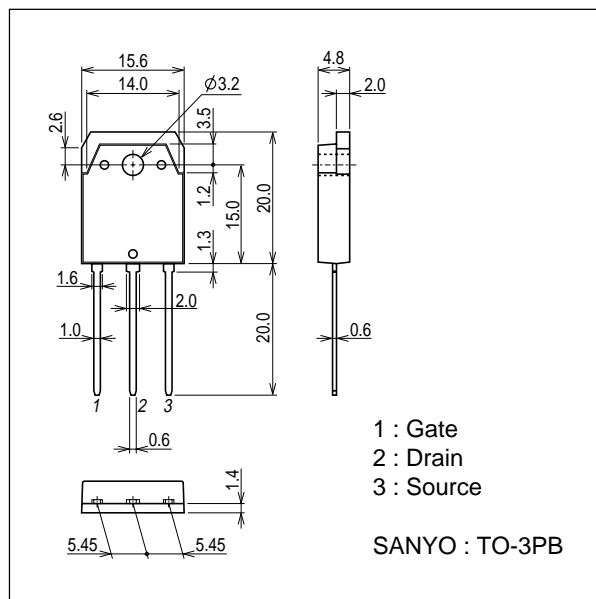
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V <sub>DS</sub> =30V, f=1MHz		380		pF
Output Capacitance	Coss	V <sub>DS</sub> =30V, f=1MHz		70		pF
Reverse Transfer Capacitance	Crss	V <sub>DS</sub> =30V, f=1MHz		40		pF
Turn-ON Delay Time	t <sub>d(on)</sub>	See specified Test Circuit.		12		ns
Rise Time	t <sub>r</sub>	See specified Test Circuit.		37		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>	See specified Test Circuit.		152		ns
Fall Time	t <sub>f</sub>	See specified Test Circuit.		59		ns
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =200V, V <sub>GS</sub> =10V, I <sub>D</sub> =2A		37.5		nC
Gate-to-Source Charge	Q <sub>gs</sub>	V <sub>DS</sub> =200V, V <sub>GS</sub> =10V, I <sub>D</sub> =2A		2.7		nC
Gate-to-Drain "Miller" Charge	Q <sub>gd</sub>	V <sub>DS</sub> =200V, V <sub>GS</sub> =10V, I <sub>D</sub> =2A		20		nC
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =2A, V <sub>GS</sub> =0V		0.88	1.2	V

Note) Although the protection diode is contained between gate and source, be careful of handling enough.

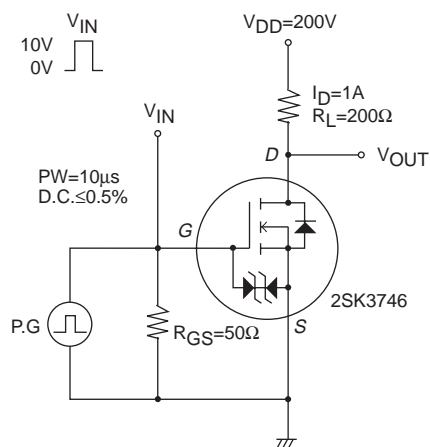
### Package Dimensions

unit : mm

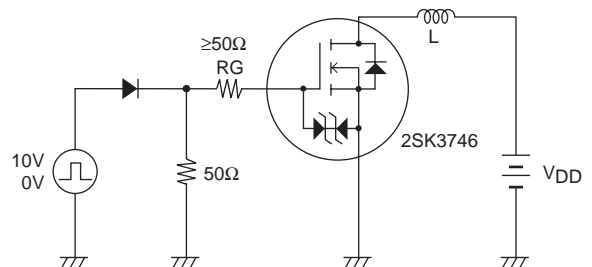
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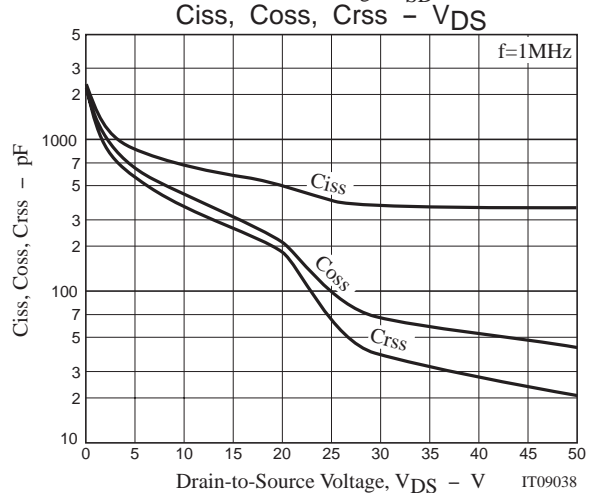
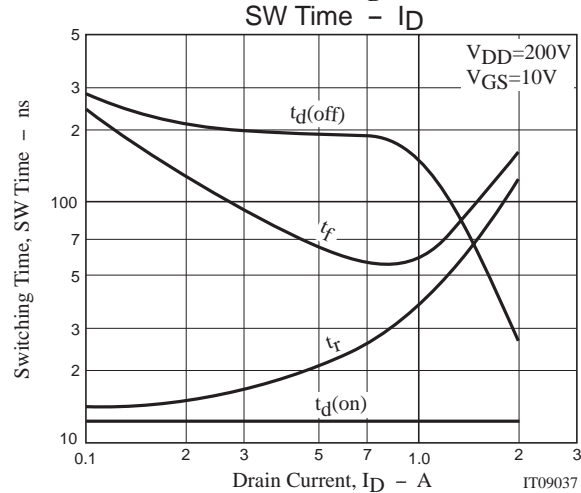
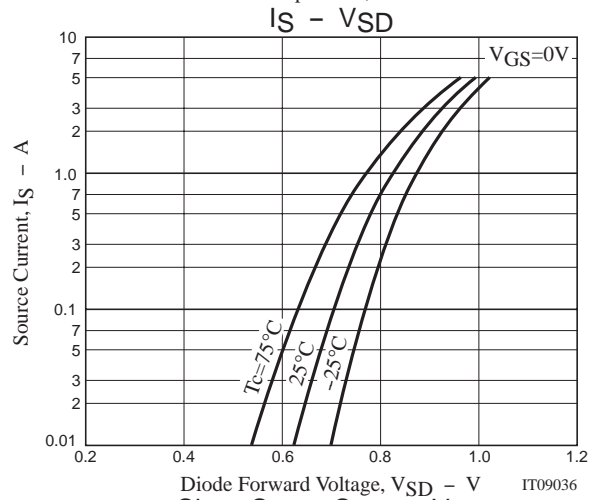
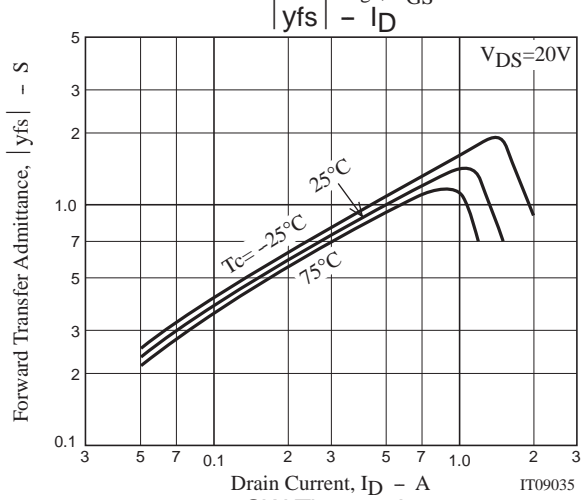
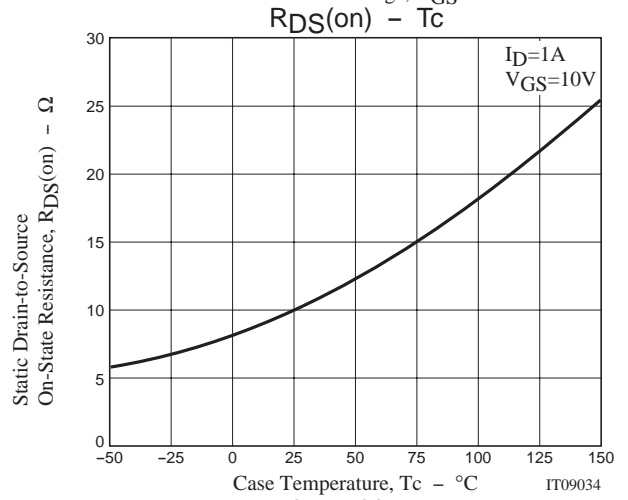
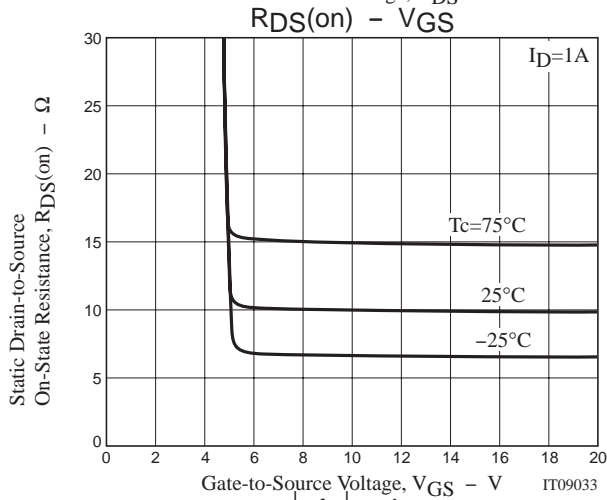
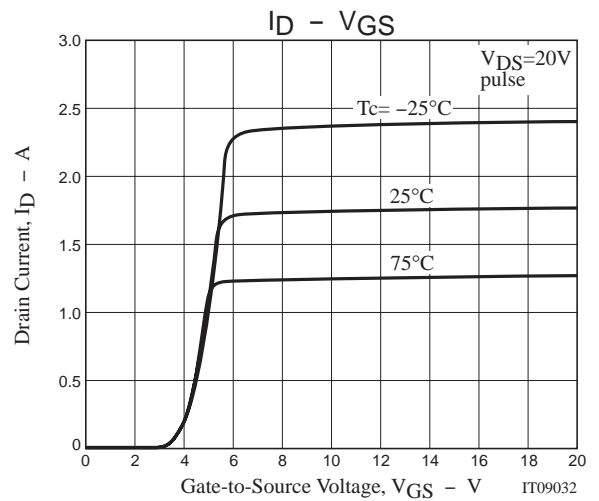
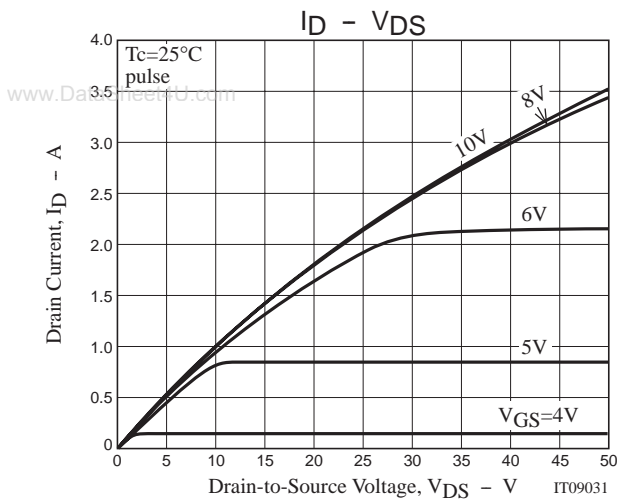


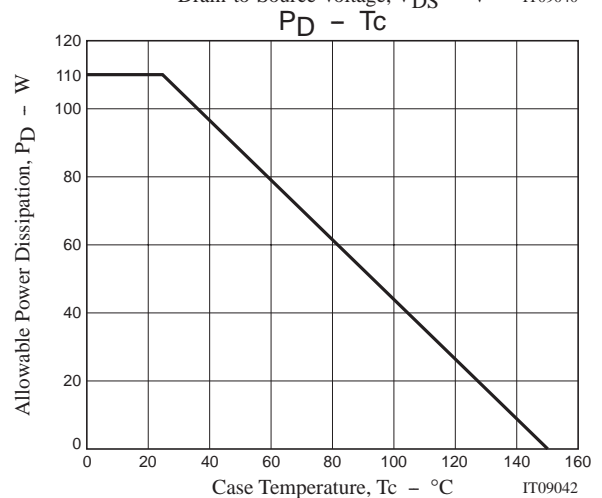
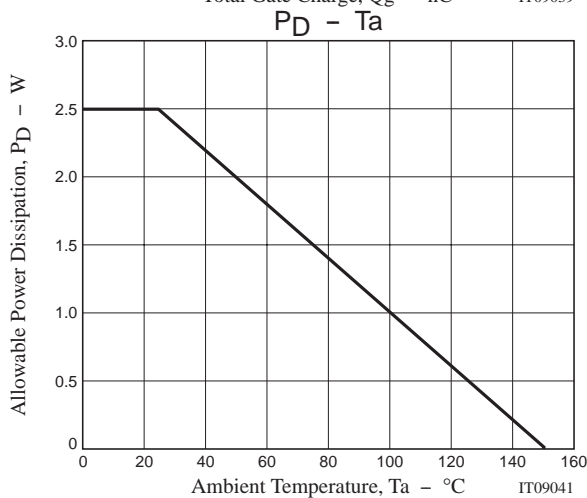
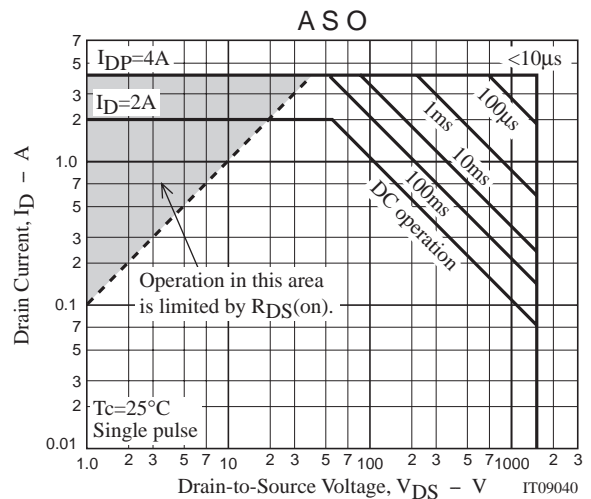
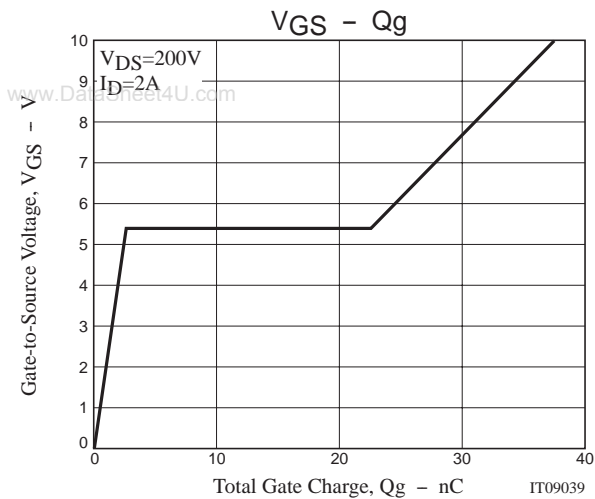
### Switching Time Test Circuit



### Avalanche Resistance Test Circuit







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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