



ON Semiconductor®

# ON Semiconductor DATA SHEET

N-Channel Silicon MOSFET

## 2SK3980 — General-Purpose Switching Device Applications

### Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 1.8V drive.

### Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>		60	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±10	V
Drain Current (DC)	I <sub>D</sub>		0.9	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	3.6	A
Allowable Power Dissipation	P <sub>D</sub>	Mounted on a ceramic board (250mm²×0.8mm)	0.9	W
		Tc=25°C	3.5	W
Channel Temperature	T <sub>ch</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	V(BR)DSS	I <sub>D</sub> =1mA, V <sub>GS</sub> =0V	60			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V			1	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0V			±10	μA
Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	0.4		1.3	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =0.5A	0.9	1.5		S
Static Drain-to-Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =0.5A, V <sub>GS</sub> =4V		635	830	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =0.3A, V <sub>GS</sub> =2.5V		705	990	mΩ
	R <sub>DS(on)3</sub>	I <sub>D</sub> =0.1A, V <sub>GS</sub> =1.8V		850	1310	mΩ
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =20V, f=1MHz		100		pF
Output Capacitance	C <sub>oss</sub>	V <sub>DS</sub> =20V, f=1MHz		9.5		pF
Reverse Transfer Capacitance	C <sub>rss</sub>	V <sub>DS</sub> =20V, f=1MHz		6.7		pF
Turn-ON Delay Time	t <sub>d(on)</sub>	See specified Test Circuit.		8.8		ns
Rise Time	t <sub>r</sub>	See specified Test Circuit.		10.5		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>	See specified Test Circuit.		21.5		ns
Fall Time	t <sub>f</sub>	See specified Test Circuit.		15.8		ns

Marking : LS

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# 2SK3980

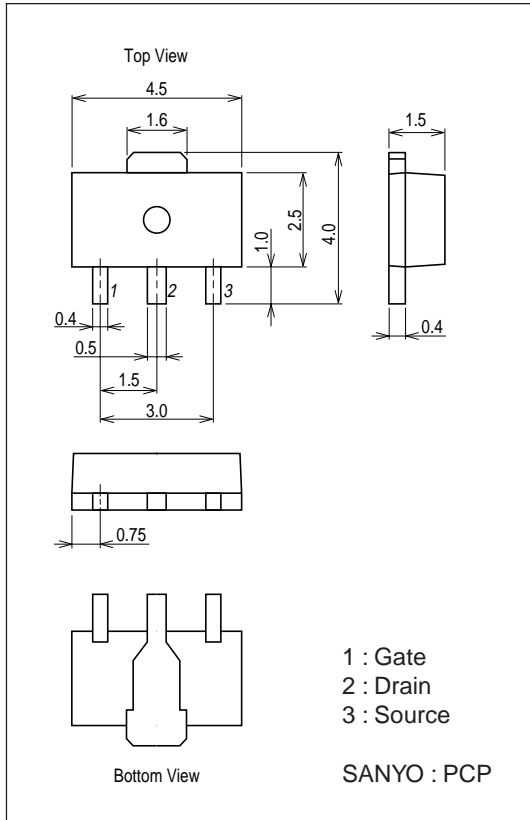
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Total Gate Charge	Qg	$V_{DS}=30V, V_{GS}=4V, I_D=0.9A$		2.1		nC
Gate-to-Source Charge	Qgs	$V_{DS}=30V, V_{GS}=4V, I_D=0.9A$		0.39		nC
Gate-to-Drain "Miller" Charge	Qgd	$V_{DS}=30V, V_{GS}=4V, I_D=0.9A$		0.28		nC
Diode Forward Voltage	VSD	$I_S=0.9A, V_{GS}=0V$		0.91	1.2	V

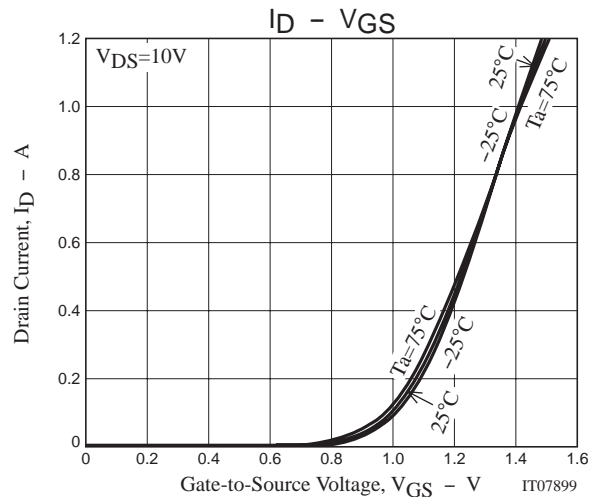
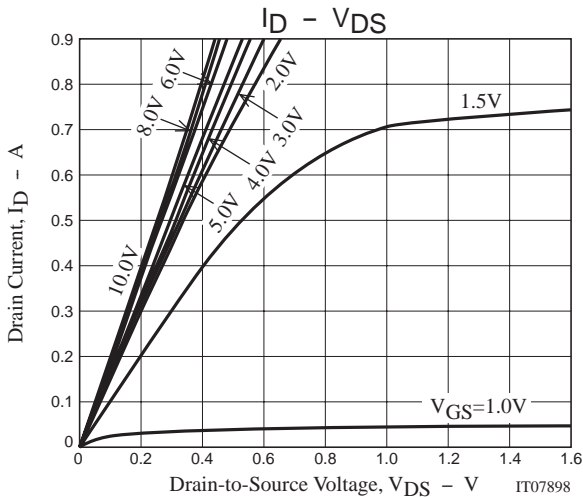
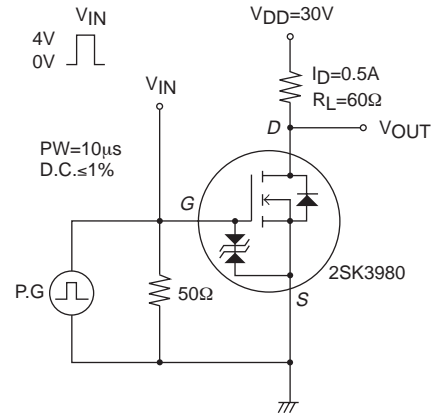
## Package Dimensions

unit : mm (typ)

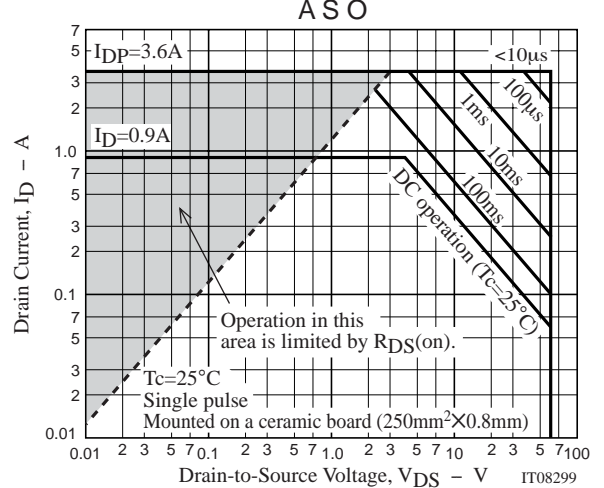
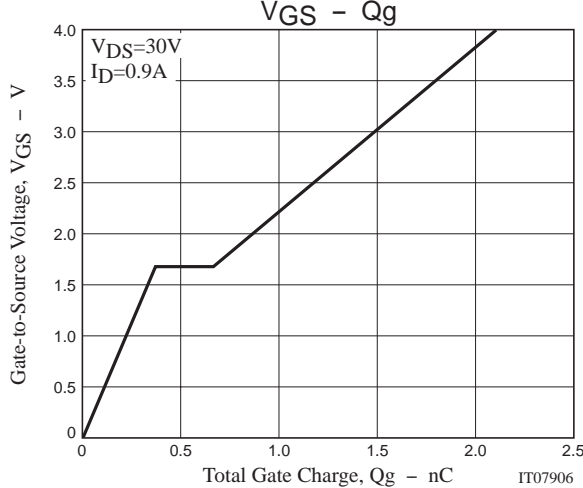
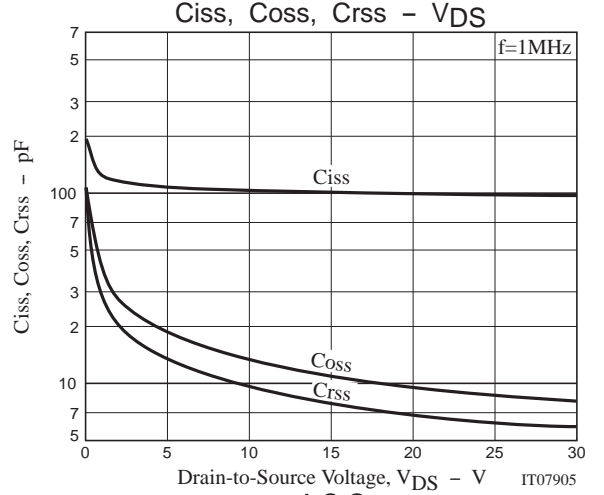
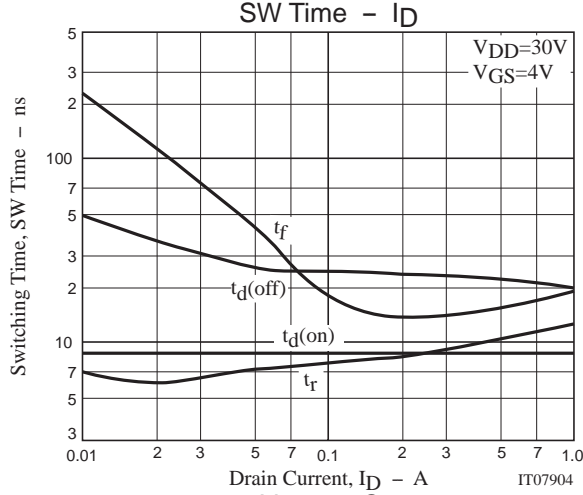
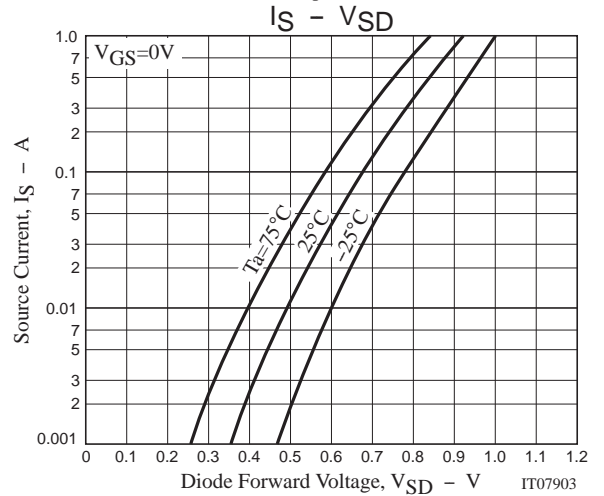
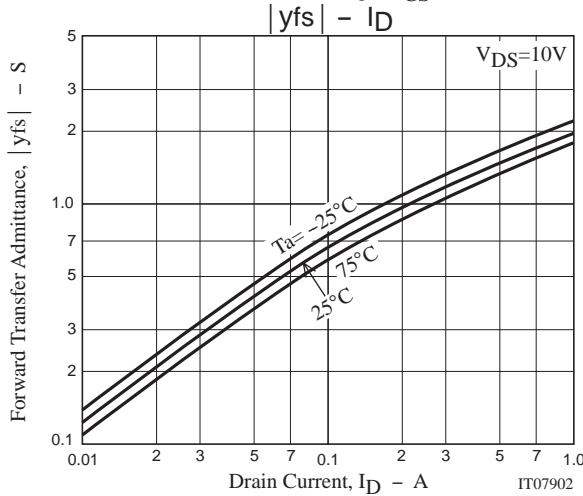
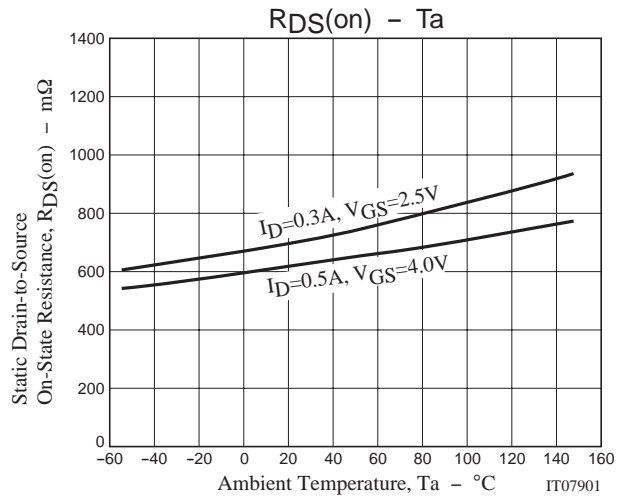
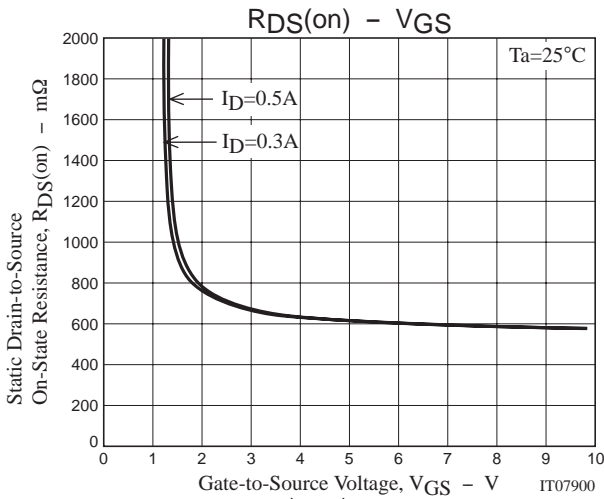
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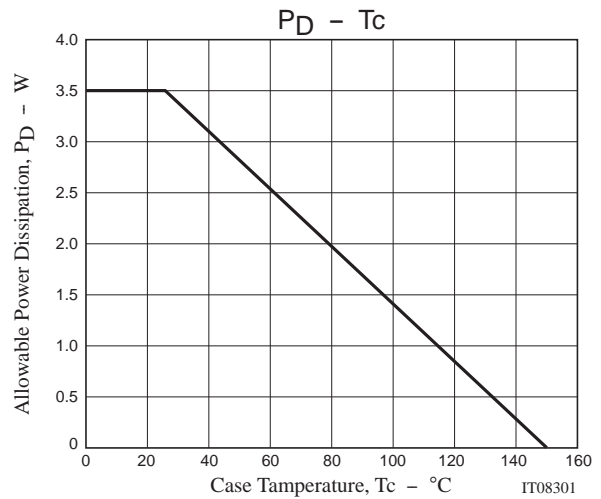
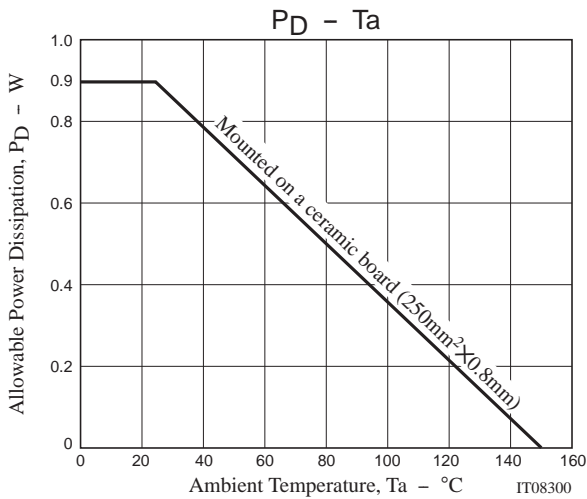
## Switching Time Test Circuit



# 2SK3980



## 2SK3980



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