



ON Semiconductor®

Ordering number : EN8641

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

Parameter	Symbol	Conditions	Ratings		Unit
Drain-to-Source Voltage	V_{DSS}			60	V
Gate-to-Source Voltage	V_{GSS}			± 10	V
Drain Current (DC)	I_D			0.9	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$		3.6	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (250mm ² × 0.8mm)		0.9	W
		$T_c=25^\circ\text{C}$		3.5	W
Channel Temperature	T_{ch}			150	$^\circ\text{C}$
Storage Temperature	T_{stg}			-55 to +150	$^\circ\text{C}$

Electrical Characteristics at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}$, $V_{GS}=0\text{V}$	60			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60\text{V}$, $V_{GS}=0\text{V}$			1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8\text{V}$, $V_{DS}=0\text{V}$			± 10	μA
Cutoff Voltage	$V_{GS(\text{off})}$	$V_{DS}=10\text{V}$, $I_D=1\text{mA}$	0.4		1.3	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10\text{V}$, $I_D=0.5\text{A}$	0.9	1.5		S
Static Drain-to-Source On-State Resistance	$R_{DS(\text{on})1}$	$I_D=0.5\text{A}$, $V_{GS}=4\text{V}$		635	830	$\text{m}\Omega$
	$R_{DS(\text{on})2}$	$I_D=0.3\text{A}$, $V_{GS}=2.5\text{V}$		705	990	$\text{m}\Omega$
	$R_{DS(\text{on})3}$	$I_D=0.1\text{A}$, $V_{GS}=1.8\text{V}$		850	1310	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{DS}=20\text{V}$, $f=1\text{MHz}$		100		pF
Output Capacitance	C_{oss}	$V_{DS}=20\text{V}$, $f=1\text{MHz}$		9.5		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=20\text{V}$, $f=1\text{MHz}$		6.7		pF
Turn-ON Delay Time	$t_{d(\text{on})}$	See specified Test Circuit.		8.8		ns
Rise Time	t_r	See specified Test Circuit.		10.5		ns
Turn-OFF Delay Time	$t_{d(\text{off})}$	See specified Test Circuit.		21.5		ns
Fall Time	t_f	See specified Test Circuit.		15.8		ns

Marking : LS

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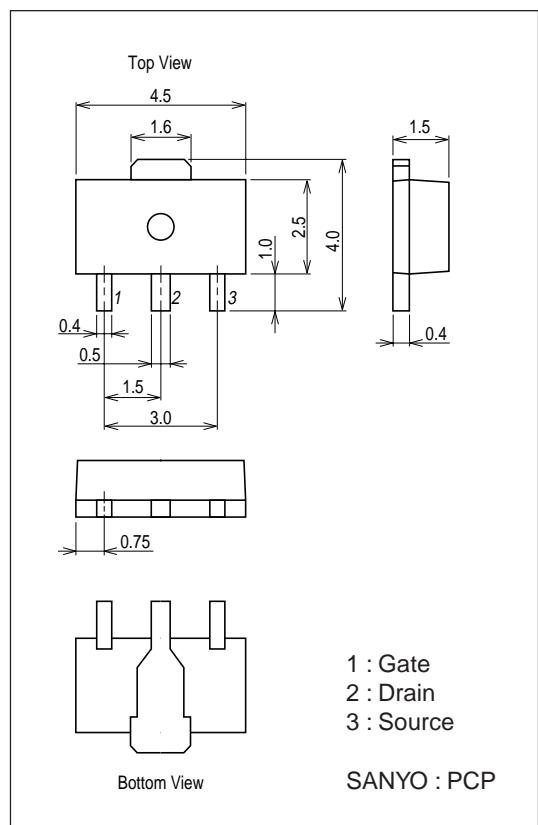
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Total Gate Charge	Qg	$V_{DS}=30V$, $V_{GS}=4V$, $I_D=0.9A$		2.1		nC
Gate-to-Source Charge	Qgs	$V_{DS}=30V$, $V_{GS}=4V$, $I_D=0.9A$		0.39		nC
Gate-to-Drain "Miller" Charge	Qgd	$V_{DS}=30V$,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

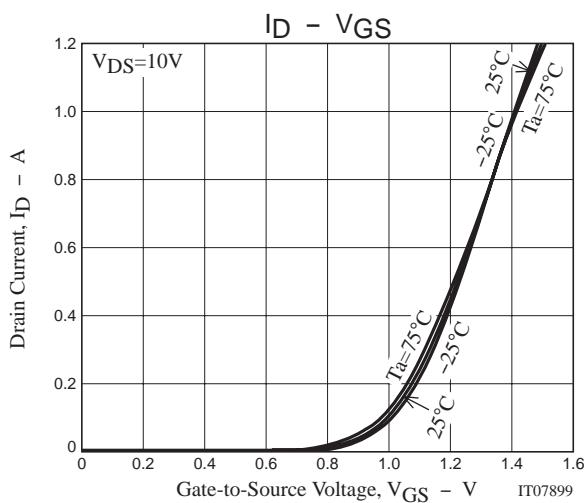
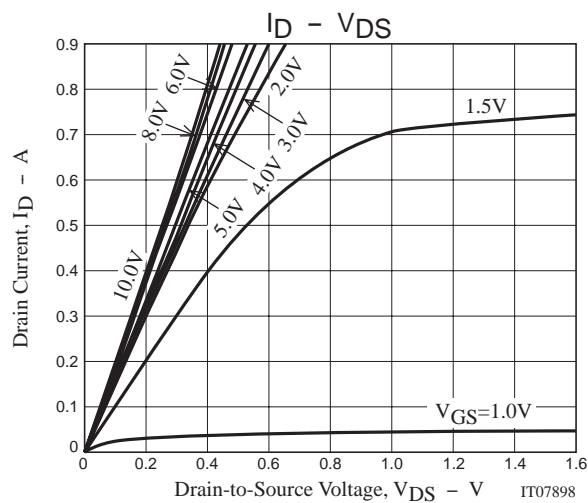
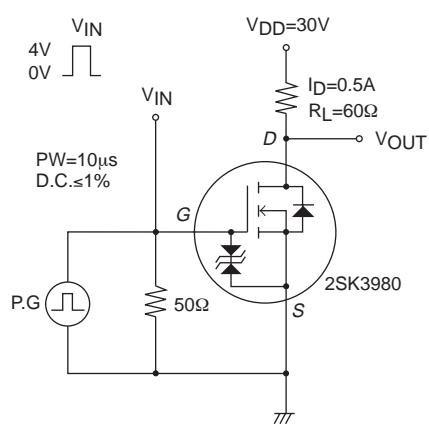
Package Dimensions

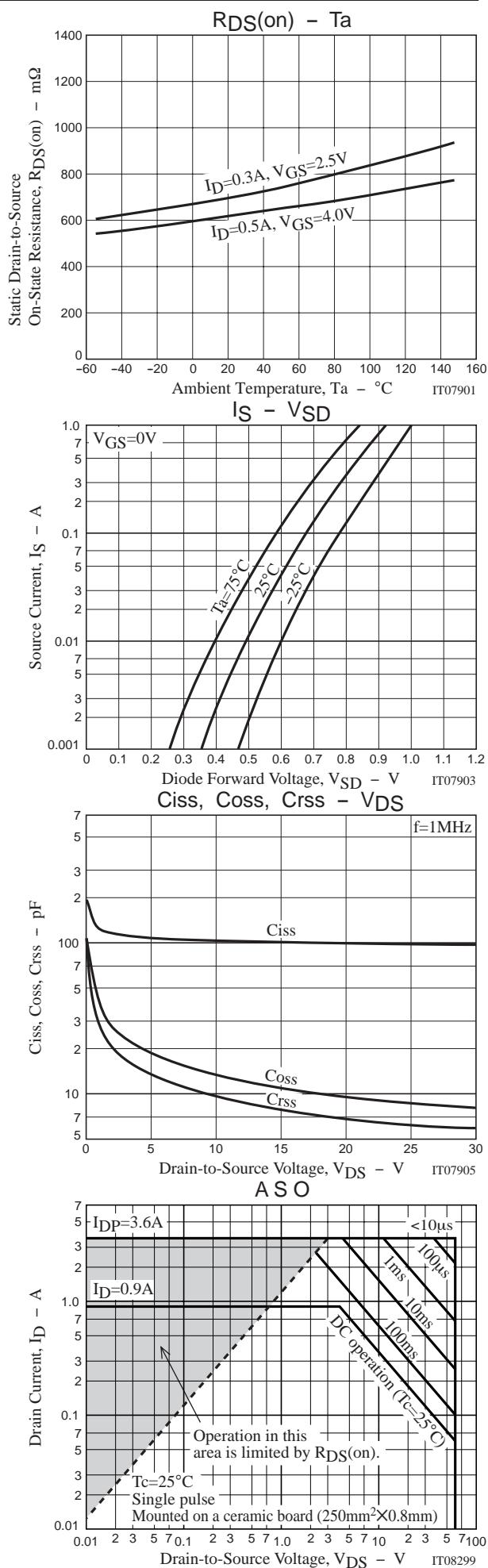
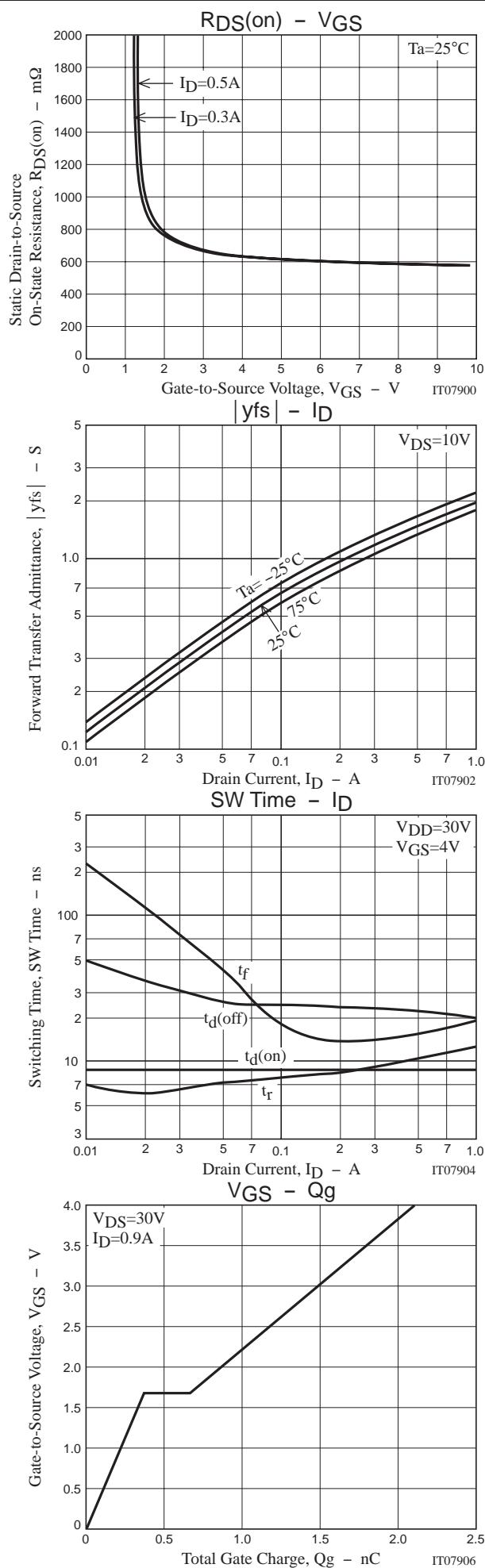
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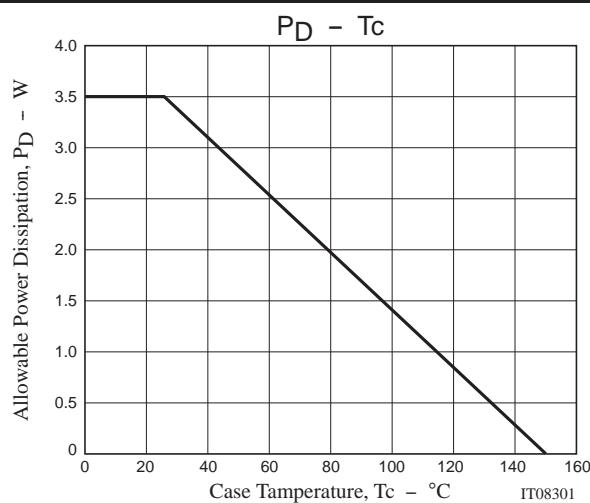
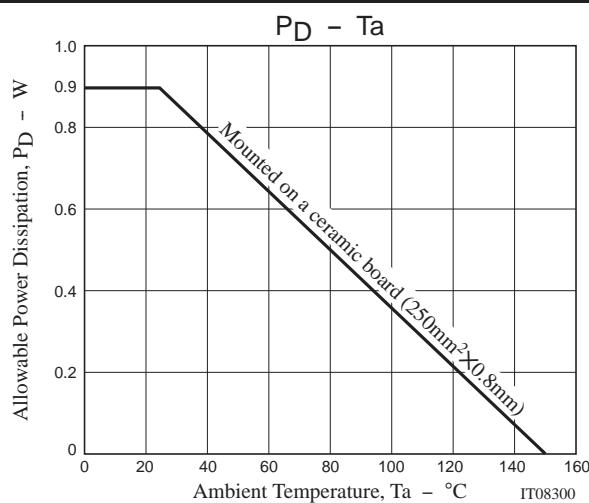
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Switching Time Test Circuit







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