



# 2SK4221 — N-Channel Silicon MOSFET

## General-Purpose Switching Device

### Applications

#### Features

- Low ON-resistance, low input capacitance, ultrahigh-speed switching.
- Adoption of high reliability 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	$V_{DSS}$		500	V
Gate-to-Source Voltage	$V_{GSS}$		$\pm 30$	V
Drain Current (DC)	$I_D$		26	A
Drain Current (Pulse)	$I_{DP}$	$PW \leq 10\mu\text{s}$ , duty cycle $\leq 1\%$	90	A
Allowable Power Dissipation	PD		2.5	W
		$T_c=25^\circ\text{C}$	220	W
Channel Temperature	$T_{ch}$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$
Avalanche Energy (Single Pulse) *1	$E_{AS}$		608	mJ
Avalanche Current *2	$I_{AV}$		14	A

Note : \*1  $V_{DD}=99\text{V}$ ,  $L=5\text{mH}$ ,  $I_{AV}=14\text{A}$

\*2  $L \leq 5\text{mH}$ , Single pulse

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=10\text{mA}$ , $V_{GS}=0\text{V}$	500			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=400\text{V}$ , $V_{GS}=0\text{V}$			100	$\mu\text{A}$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30\text{V}$ , $V_{DS}=0\text{V}$			$\pm 100$	nA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10\text{V}$ , $I_D=1\text{mA}$	3		5	V

Marking : K4221

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# 2SK4221

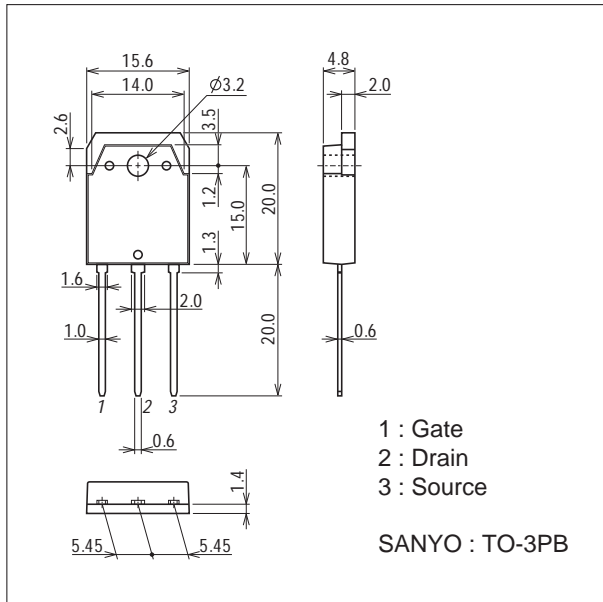
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10V, I_D=13A$	7.5	15.5		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)}$	$I_D=13A, V_{GS}=10V$		0.18	0.24	$\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=30V, f=1MHz$		2250		pF
Output Capacitance	$C_{oss}$	$V_{DS}=30V, f=1MHz$		450		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS}=30V, f=1MHz$		90		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		44		ns
Rise Time	$t_r$	See specified Test Circuit.		156		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		224		ns
Fall Time	$t_f$	See specified Test Circuit.		94		ns
Total Gate Charge	$Q_g$	$V_{DS}=200V, V_{GS}=10V, I_D=26A$		87		nC
Gate-to-Source Charge	$Q_{gs}$	$V_{DS}=200V, V_{GS}=10V, I_D=26A$		16		nC
Gate-to-Drain "Miller" Charge	$Q_{gd}$	$V_{DS}=200V, V_{GS}=10V, I_D=26A$		47		nC
Diode Forward Voltage	$V_{SD}$	$I_S=26A, V_{GS}=0V$		1.0	1.3	V

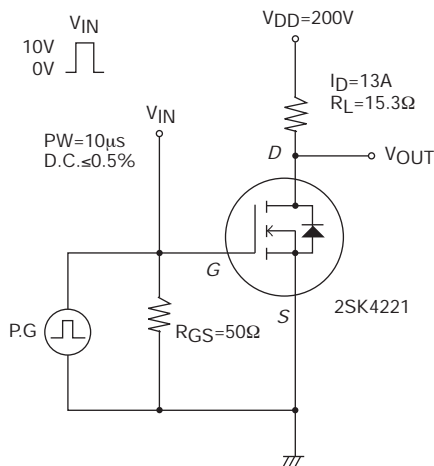
## Package Dimensions

unit : mm (typ)

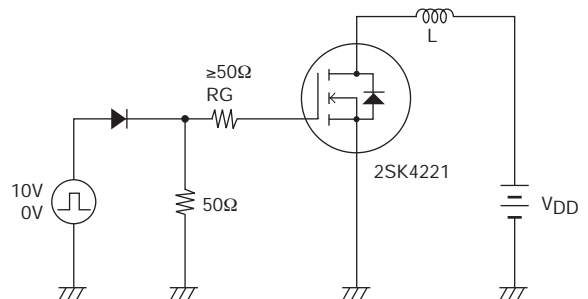
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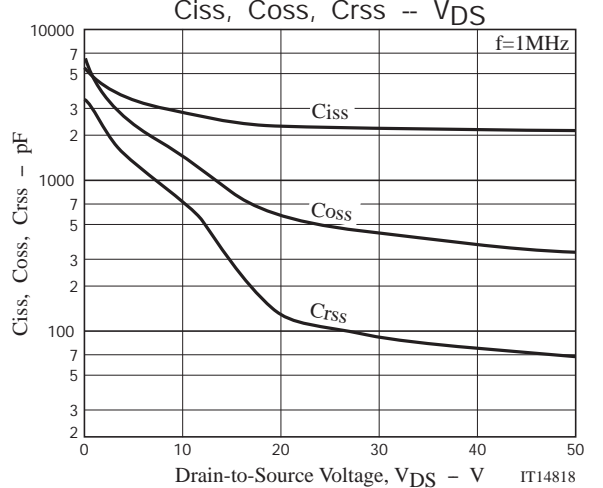
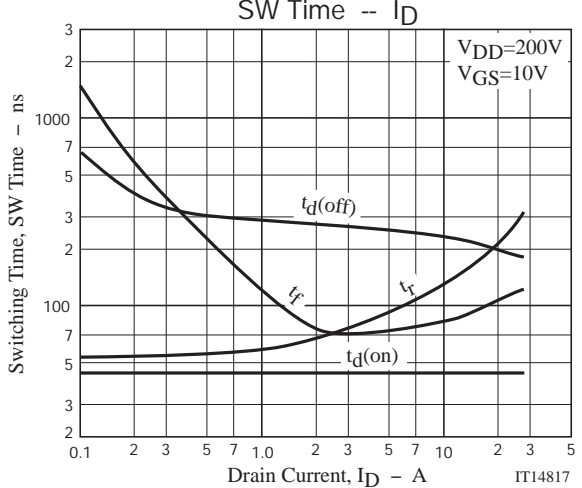
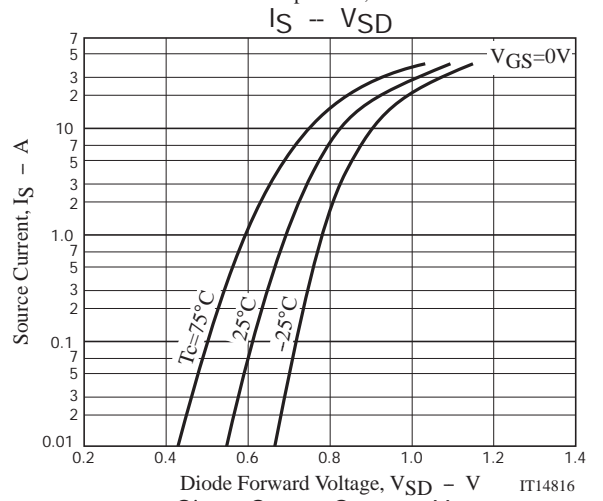
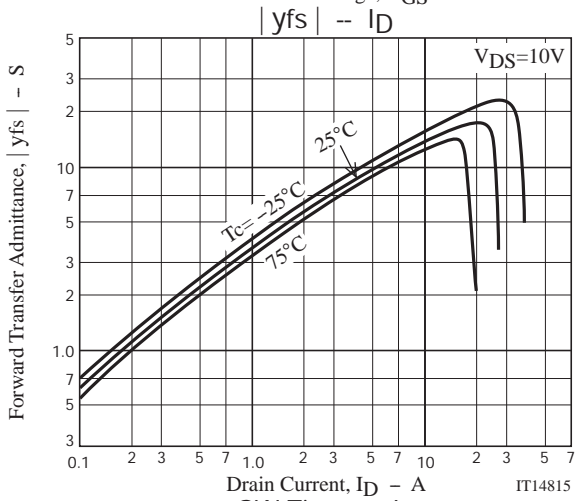
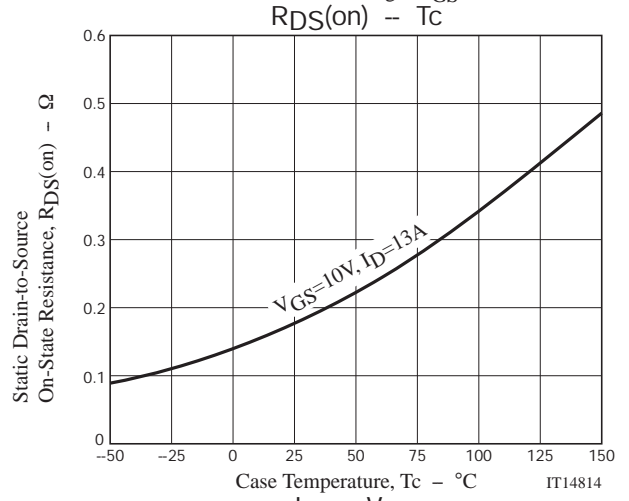
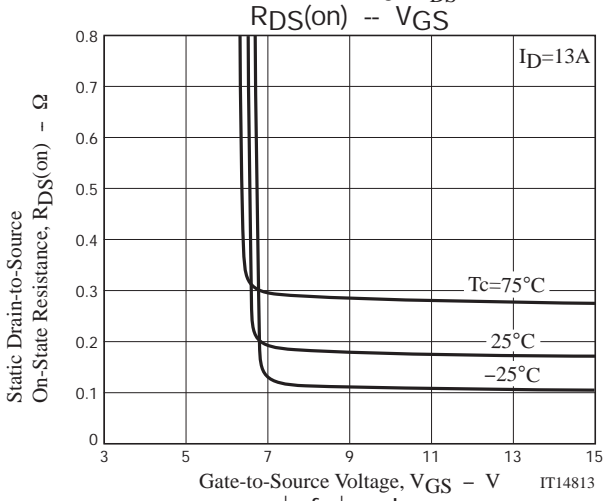
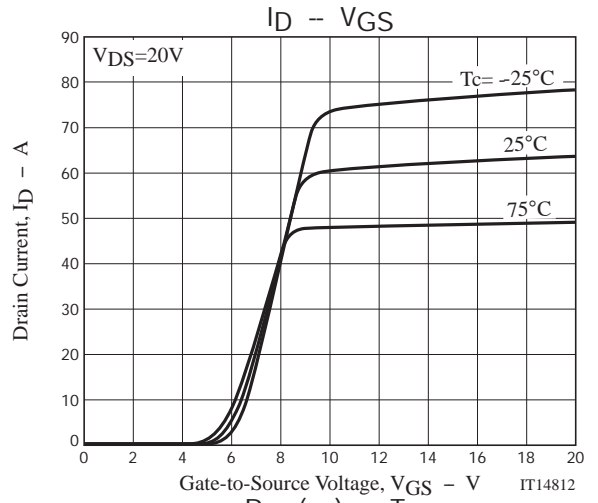
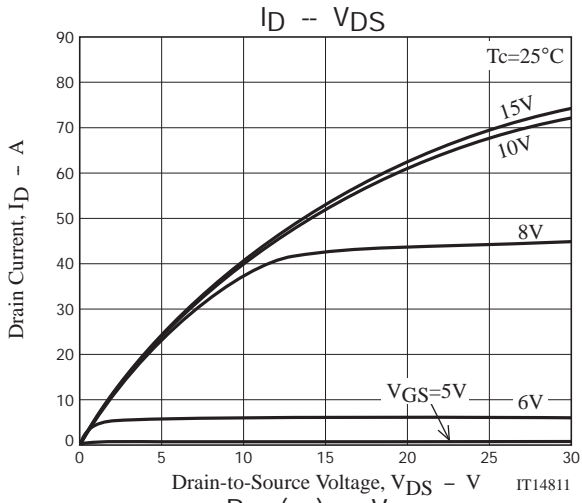


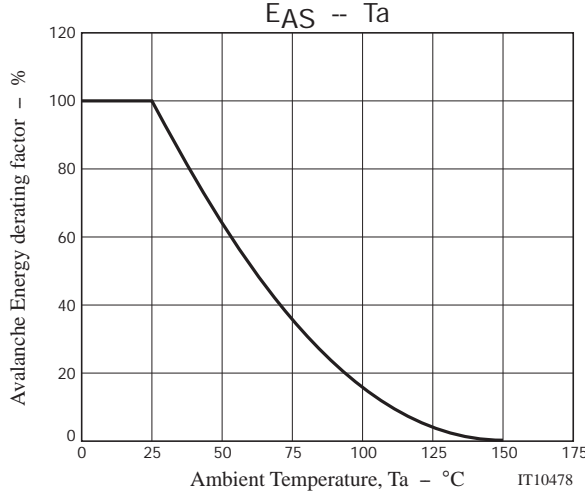
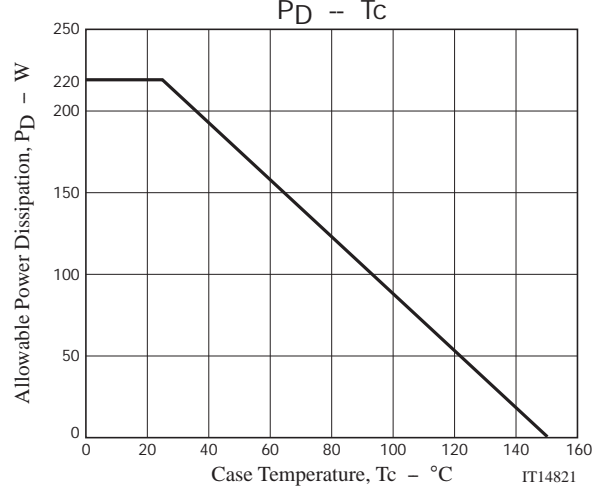
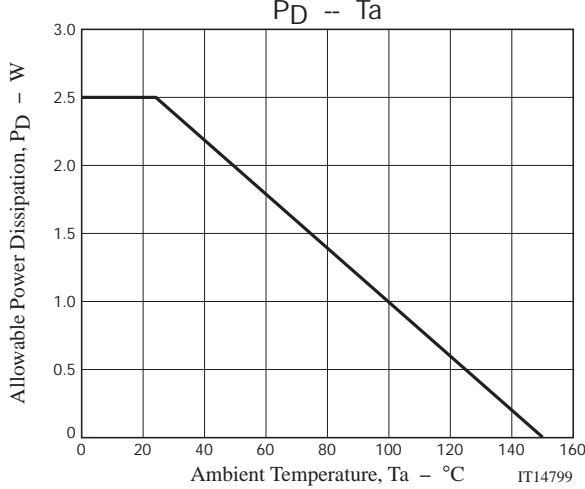
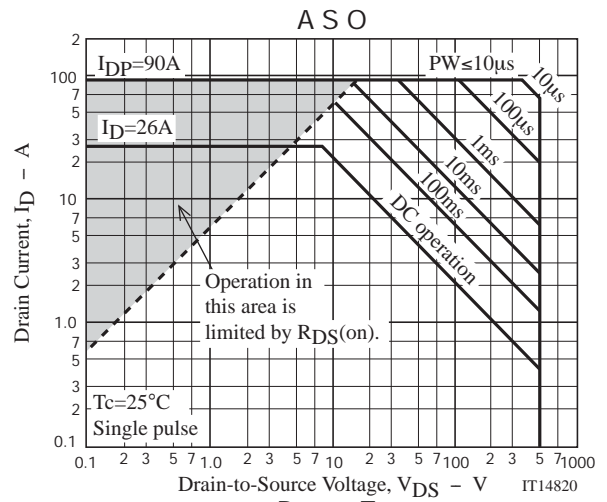
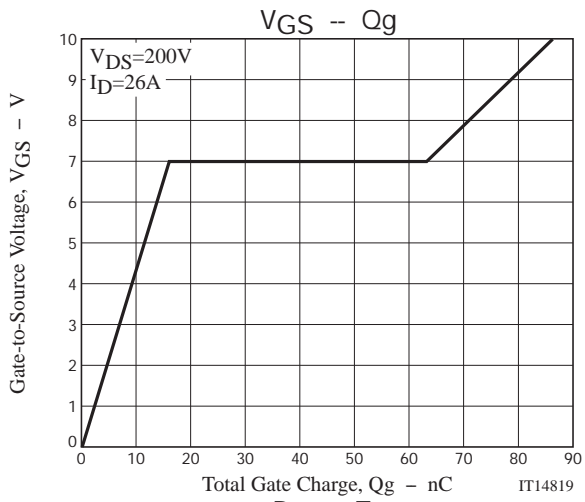
## Switching Time Test Circuit



## Avalanche Resistance Test Circuit







Note on usage : Since the 2SK4221 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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