



ON Semiconductor®

ON Semiconductor
DATA SHEET**2SK3821** — N-Channel Silicon MOSFET
General-Purpose Switching Device Applications**Features**

- Low ON-resistance.
- 4V drive.
- Ultrahigh-speed switching.
- Motor drive, DC / DC converter.
- 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}		100	V
Gate-to-Source Voltage	V_{GSS}		± 20	V
Drain Current (DC)	I_D		40	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	160	A
Allowable Power Dissipation	P_D		1.65	W
		$T_c=25^\circ\text{C}$	65	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}		200	mJ
Avalanche Current *2	I_{AV}		40	A

Note : *1 $V_{DD}=20\text{V}$, $L=200\mu\text{H}$, $I_{AV}=40\text{A}$ *2 $L \leq 200\mu\text{H}$, single pulse**Electrical Characteristics** at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}$, $V_{GS}=0$	100			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100\text{V}$, $V_{GS}=0$			1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS} = \pm 16\text{V}$, $V_{DS}=0$			± 10	μA
Cutoff Voltage	$V_{GS(off)}$	$V_{DS}=10\text{V}$, $I_D=1\text{mA}$	1.2		2.6	V
Forward Transfer Admittance	$ y_{fs} $	$V_{DS}=10\text{V}$, $I_D=20\text{A}$	18.5	31		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=20\text{A}$, $V_{GS}=10\text{V}$		25	33	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=20\text{A}$, $V_{GS}=4\text{V}$		30	42	$\text{m}\Omega$

Marking : K3821

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2SK3821

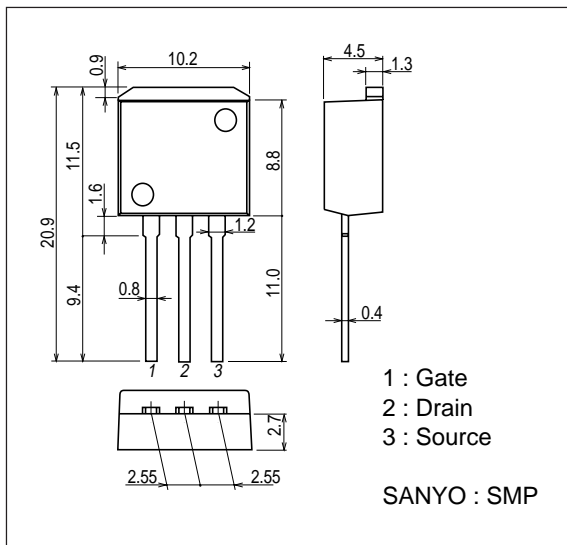
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V _{DS} =20V, f=1MHz		4200		pF
Output Capacitance	Coss	V _{DS} =20V, f=1MHz		300		pF
Reverse Transfer Capacitance	Crss	V _{DS} =20V, f=1MHz		250		pF
Turn-ON Delay Time	t _{d(on)}	See specified Test Circuit.		30		ns
Rise Time	t _r	See specified Test Circuit.		68		ns
Turn-OFF Delay Time	t _{d(off)}	See specified Test Circuit.		300		ns
Fall Time	t _f	See specified Test Circuit.		110		ns
Total Gate Charge	Qg	V _{DS} =50V, V _{GS} =10V, I _D =40A		73		nC
Gate-to-Source Charge	Qgs	V _{DS} =50V, V _{GS} =10V, I _D =40A		12.5		nC
Gate-to-Drain "Miller" Charge	Qgd	V _{DS} =50V, V _{GS} =10V, I _D =40A		16		nC
Diode Forward Voltage	V _{SD}	I _S =40A, V _{GS} =0	1.0	1.2		V

Package Dimensions

unit : mm

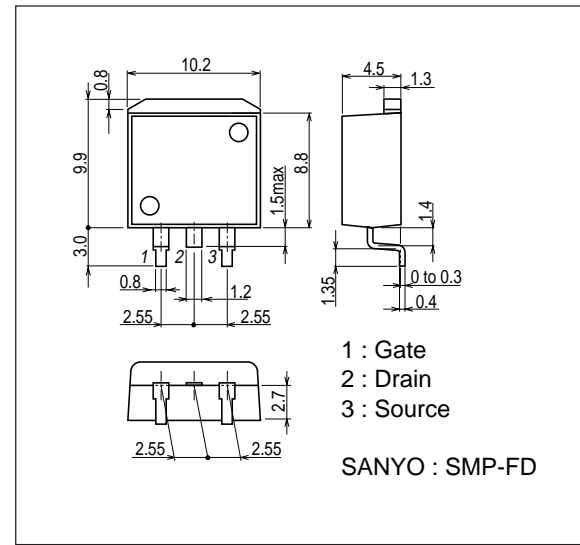
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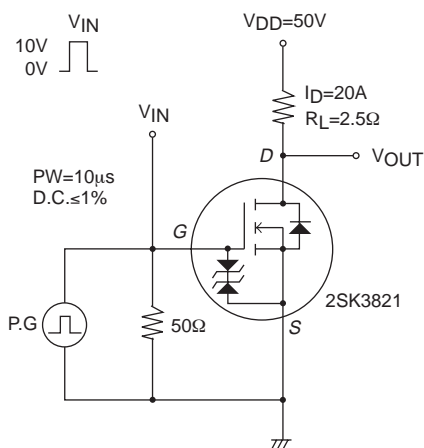
Package Dimensions

unit : mm

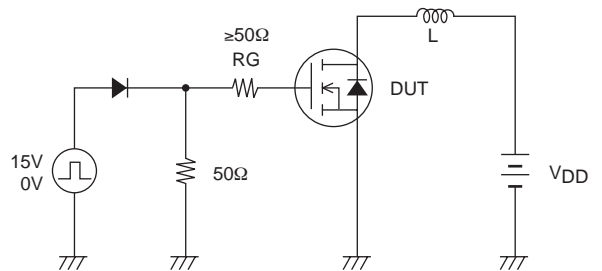
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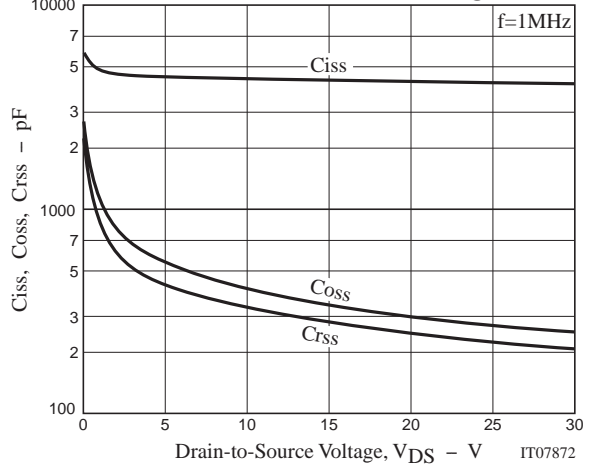
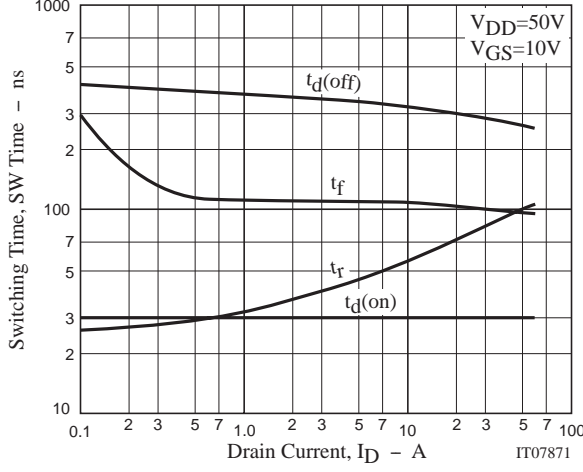
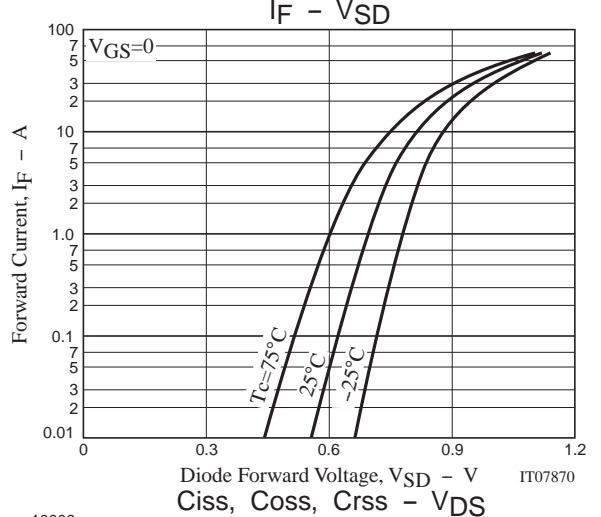
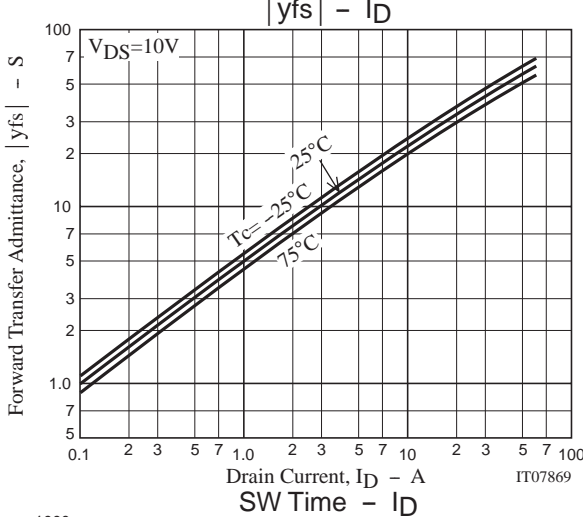
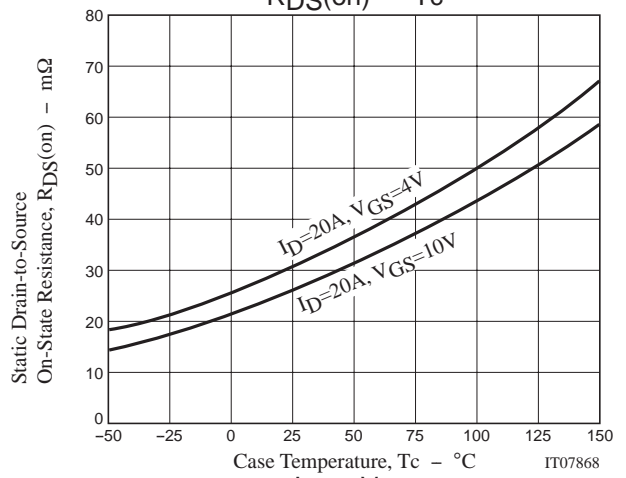
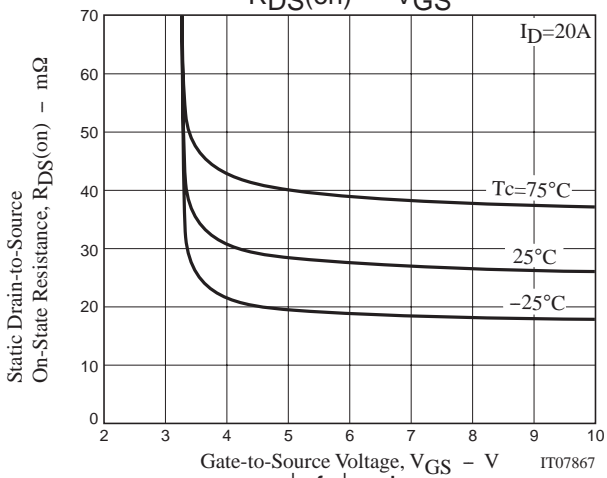
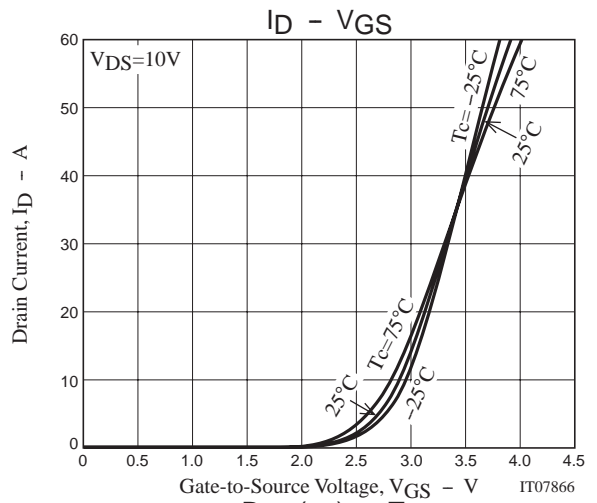
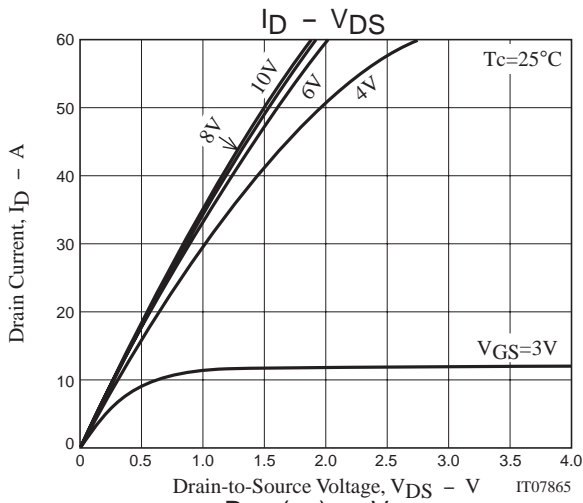


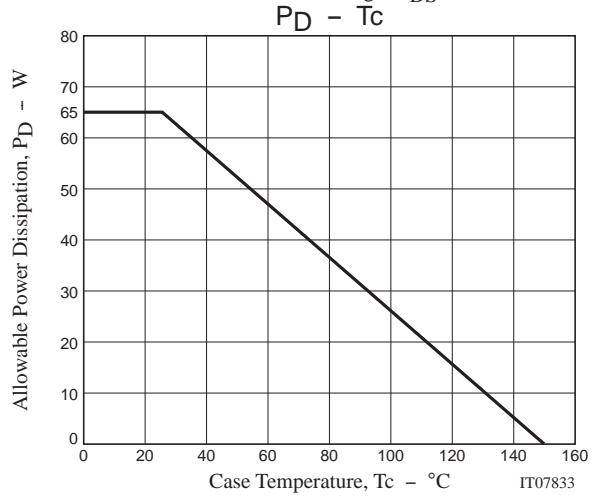
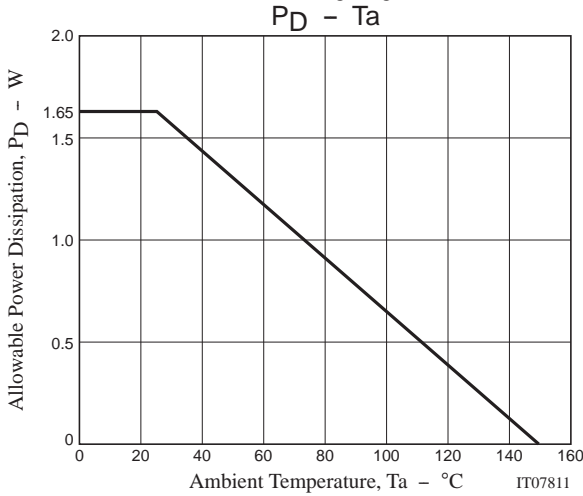
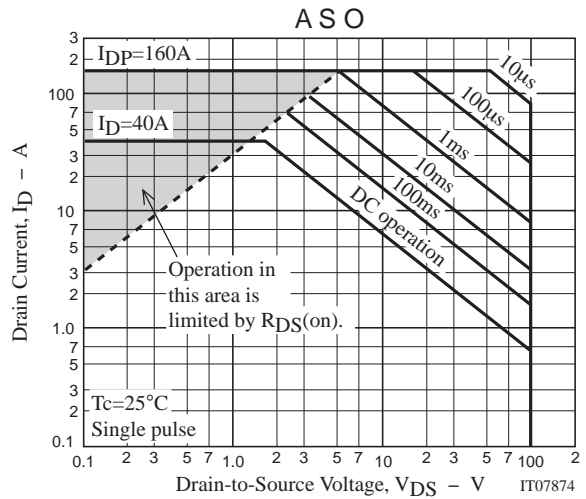
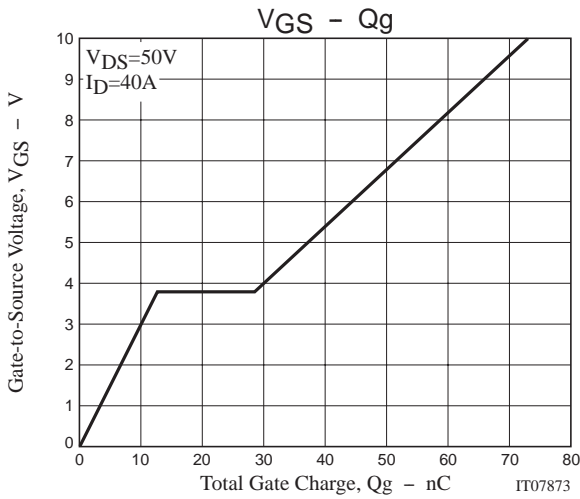
Switching Time Test Circuit



Unclamped Inductive Test Circuit







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