



2SK3831

N-Channel Silicon MOSFET

General-Purpose Switching Device Applications

Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 4V drive.
- 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_{DS}		60	V
Gate-to-Source Voltage	V_{GS}		± 20	V
Drain Current (DC)	I_D		85	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	340	A
Allowable Power Dissipation	P_D		2.5	W
		$T_c=25^\circ\text{C}$	100	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}		271	mJ
Avalanche Current *2	I_{AV}		85	A

*1. $V_{DD}=20\text{V}$, $L=50\mu\text{H}$, $I_{AV}=85\text{A}$

*2. $L \leq 50\mu\text{H}$, 1 Pulse

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=1\text{mA}$, $V_{GS}=0$	60			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60\text{V}$, $V_{GS}=0$			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} $	$V_{DS}=10\text{V}$, $I_D=43\text{A}$	30	50		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=43\text{A}$, $V_{GS}=10\text{V}$		10	13	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=43\text{A}$, $V_{GS}=4\text{V}$		13	18	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{DS}=20\text{V}$, $f=1\text{MHz}$		5250		pF
Output Capacitance	C_{oss}	$V_{DS}=20\text{V}$, $f=1\text{MHz}$		780		pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=20\text{V}$, $f=1\text{MHz}$		525		pF

Marking : K3831

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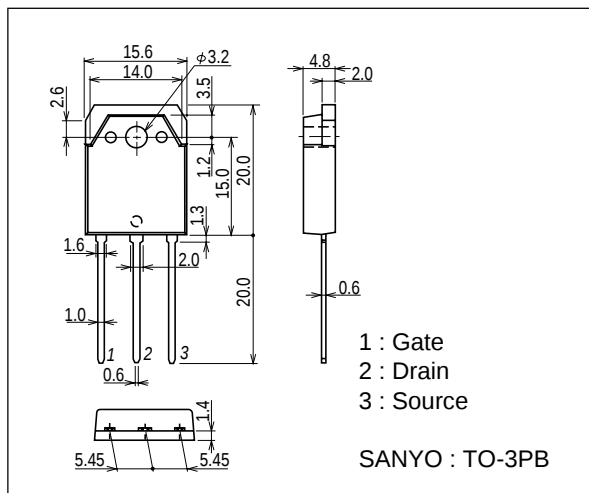
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		40		ns
Rise Time	t_r	See specified Test Circuit.		370		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		355		ns
Fall Time	t_f	See specified Test Circuit.		315		ns
Total Gate Charge	Q_g	$V_{DS}=30V, V_{GS}=10V, I_D=85A$		113		nC
Gate-to-Source Charge	Q_{gs}	$V_{DS}=30V, V_{GS}=10V, I_D=85A$		19		nC
Gate-to-Drain "Miller" Charge	Q_{gd}	$V_{DS}=30V, V_{GS}=10V, I_D=85A$		28		nC
Diode Forward Voltage	V_{SD}	$I_S=85A, V_{GS}=0$		1.18	1.5	V

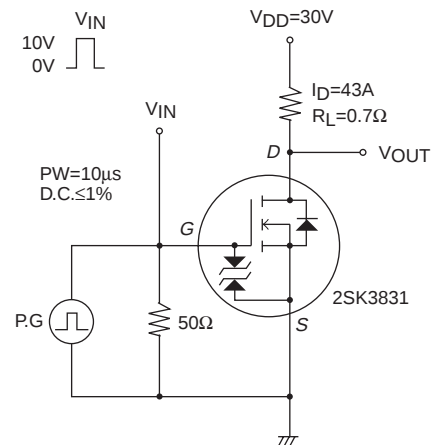
Package Dimensions

unit : mm

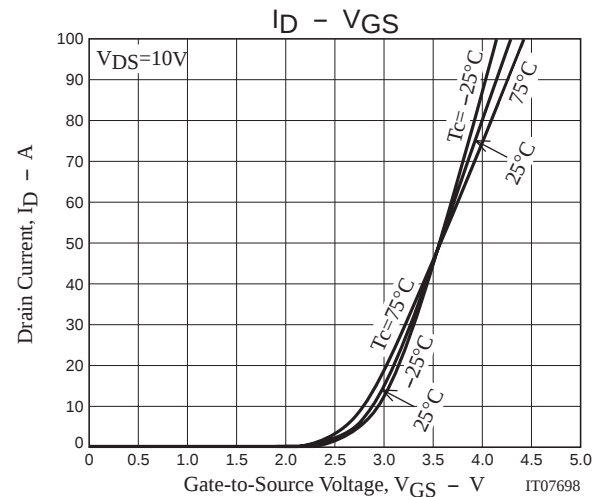
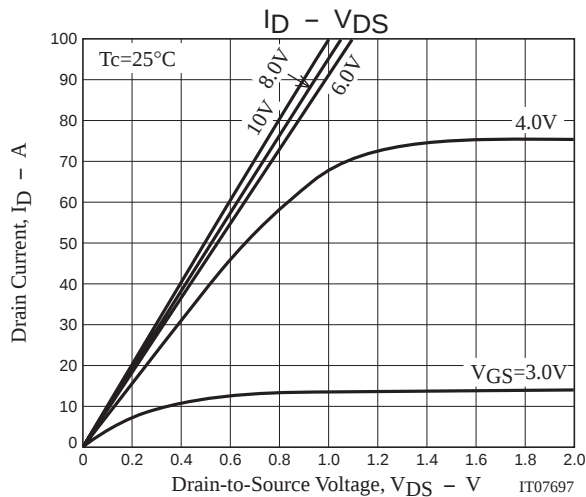
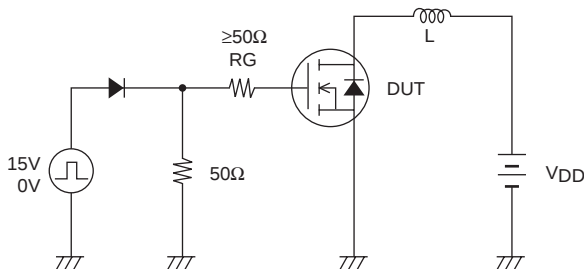
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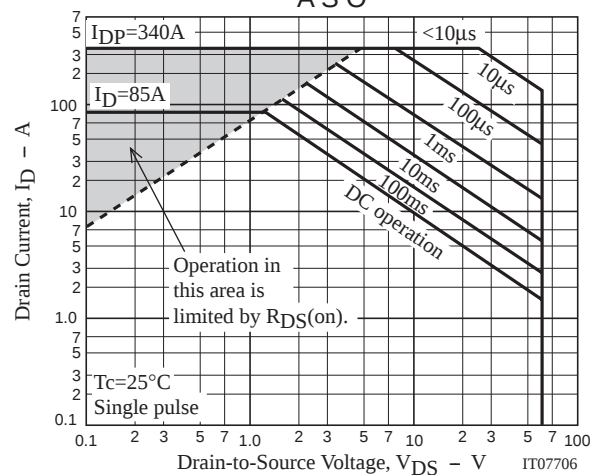
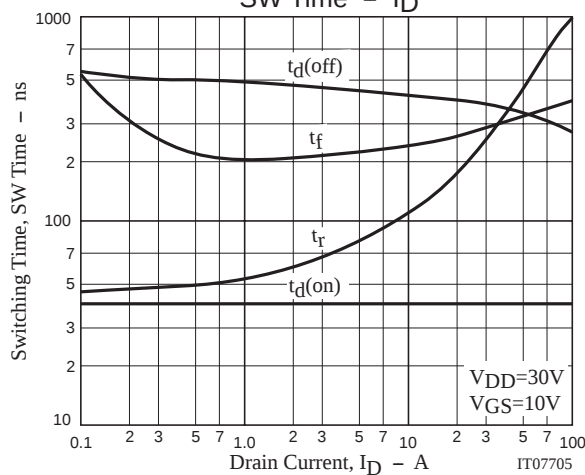
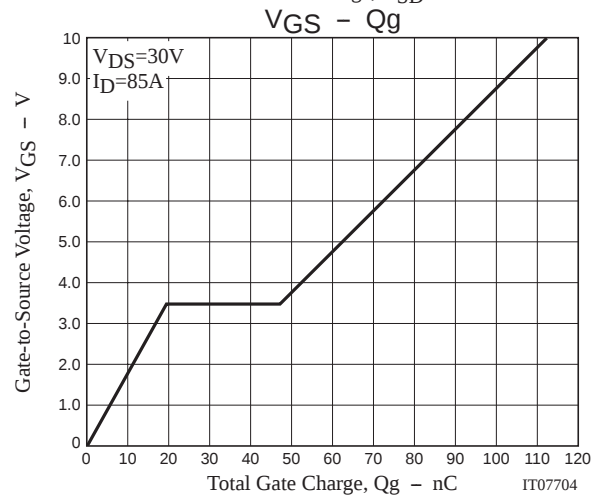
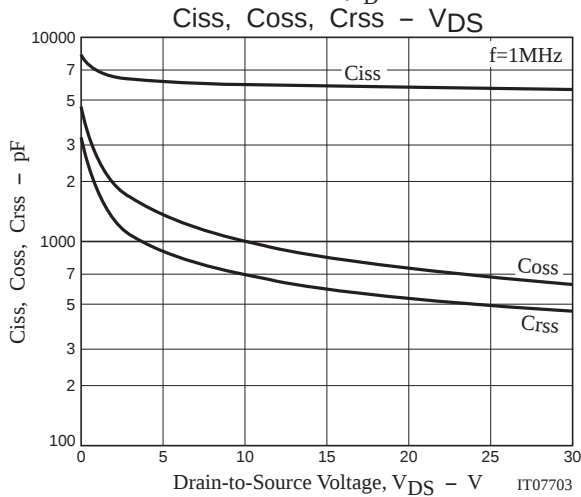
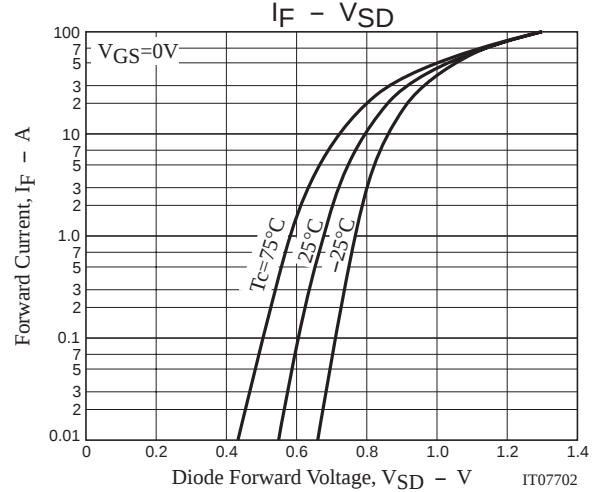
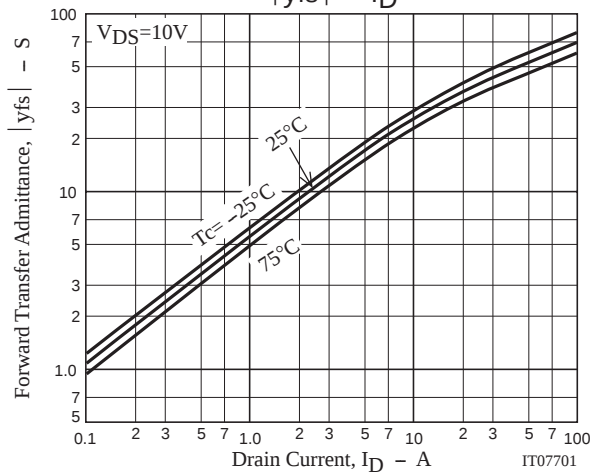
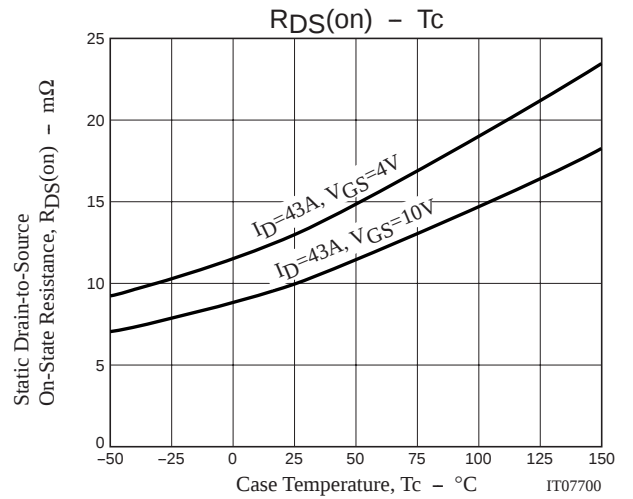
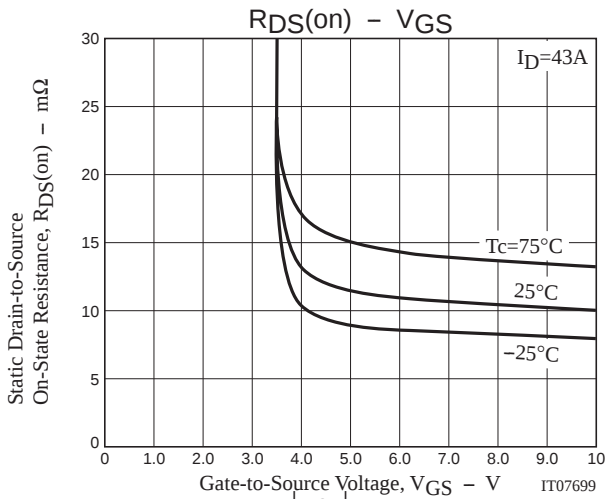


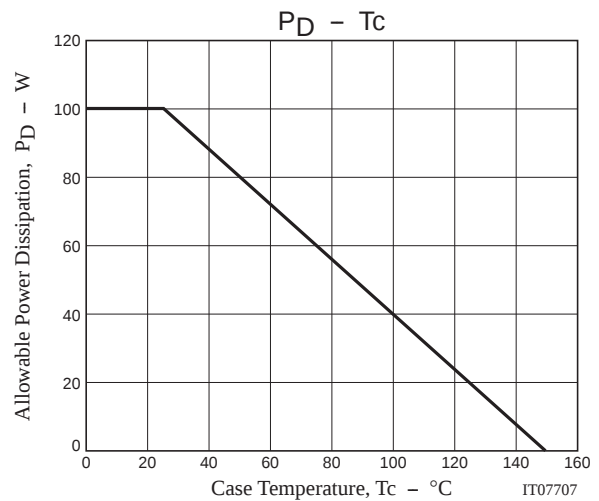
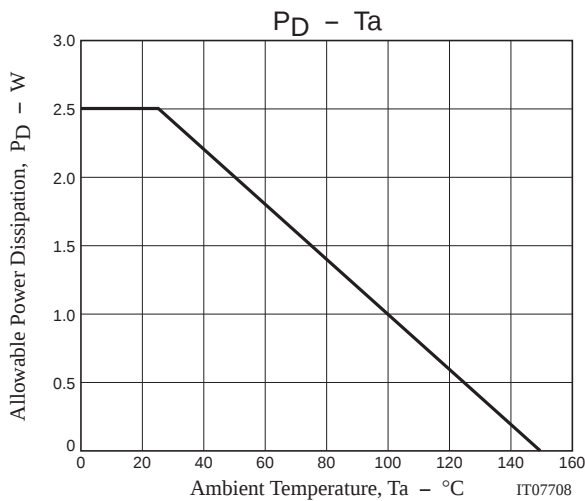
Switching Time Test Circuit



Unclamped Inductive Circuit







Note on usage : Since the 2SK3831 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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