



# 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 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>		±20	V
Drain Current (DC)	I <sub>D</sub>		85	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	340	A
Allowable Power Dissipation	P <sub>D</sub>		2.5	W
		T <sub>c</sub> =25°C	100	W
Channel Temperature	T <sub>ch</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C
Avalanche Energy (Single Pulse) *1	E <sub>AS</sub>		271	mJ
Avalanche Current *2	I <sub>AV</sub>		85	A

\*1. V<sub>DD</sub>=20V, L=50μH, I<sub>AV</sub>=85A

\*2. L≤50μH, 1 Pulse

**Electrical Characteristics** at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =1mA, V <sub>GS</sub> =0	60			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0			1	μA
Gate-to-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±16V, V <sub>DS</sub> =0			±10	μA
Cutoff Voltage	V <sub>GS(off)</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =1mA	1.2		2.6	V
Forward Transfer Admittance	y <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =43A	30	50		S
Static Drain-to-Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =43A, V <sub>GS</sub> =10V		10	13	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =43A, V <sub>GS</sub> =4V		13	18	mΩ
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =20V, f=1MHz		5250		pF
Output Capacitance	C <sub>oss</sub>	V <sub>DS</sub> =20V, f=1MHz		780		pF
Reverse Transfer Capacitance	C <sub>rss</sub>	V <sub>DS</sub> =20V, f=1MHz		525		pF

Marking : K3831

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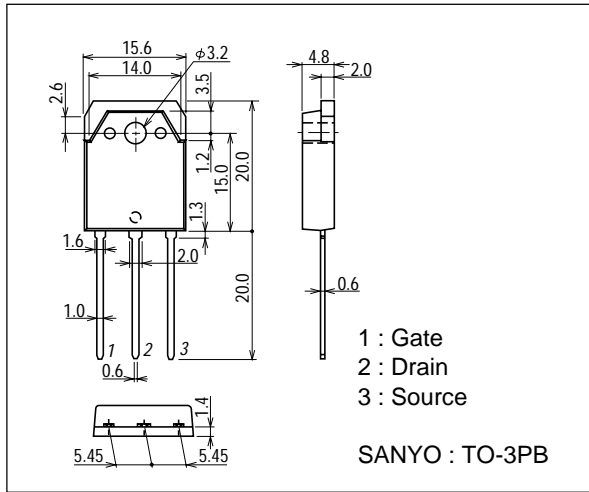
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit.		40		ns
Rise Time	$t_r$	See specified Test Circuit.		370		ns
Turn-OFF Delay Time	$t_{d(off)}$	See specified Test Circuit.		355		ns
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

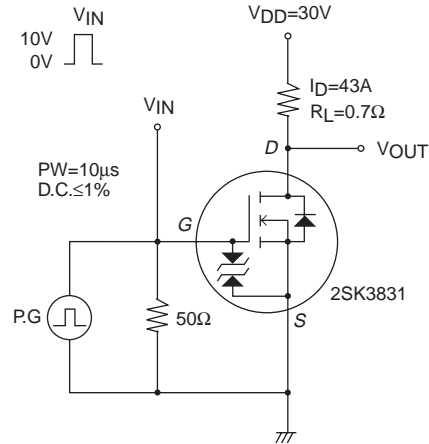
## Package Dimensions

unit : mm

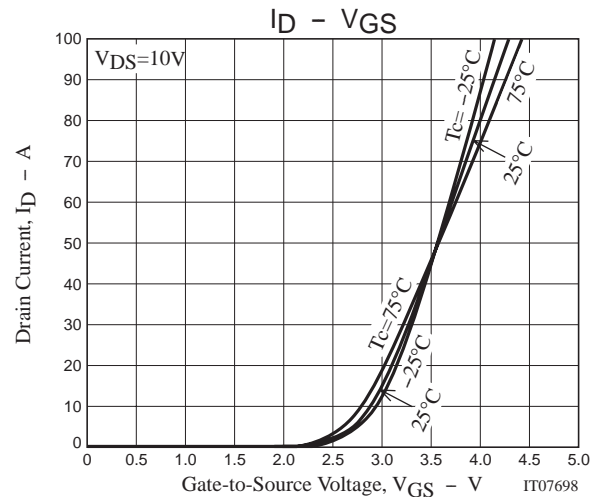
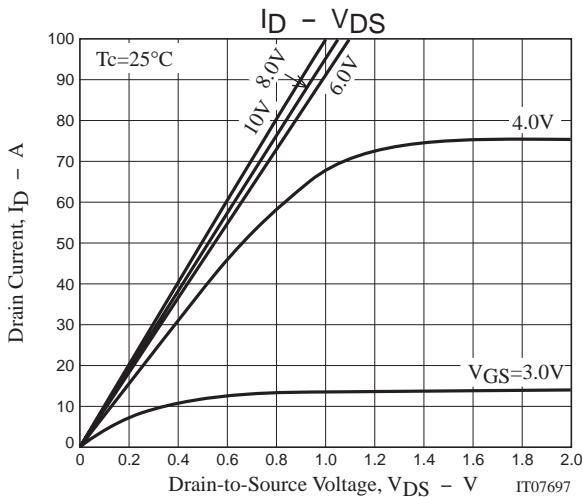
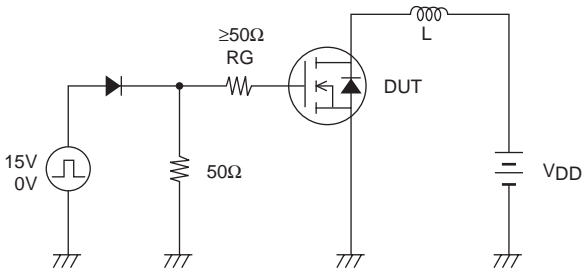
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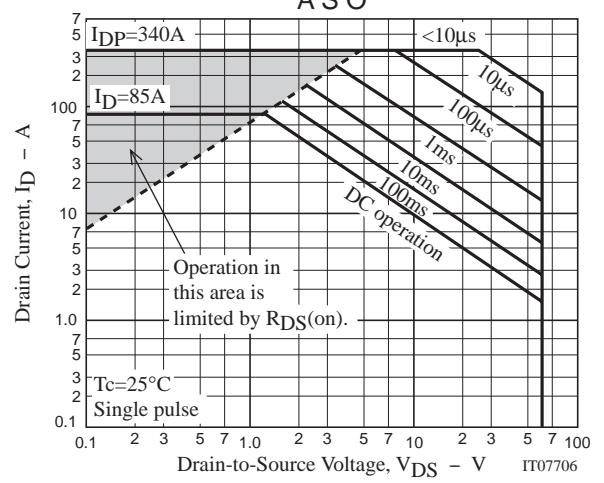
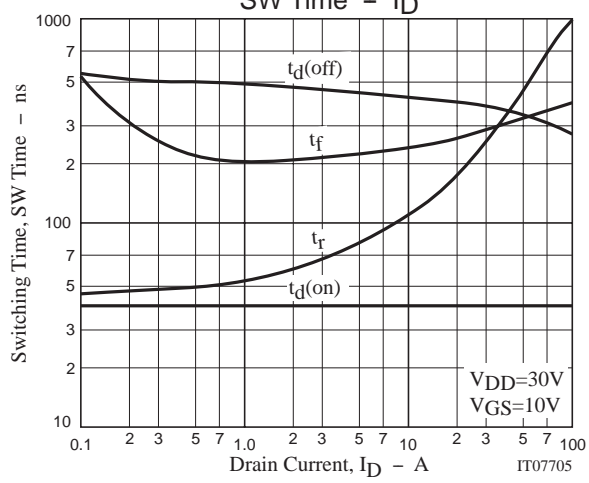
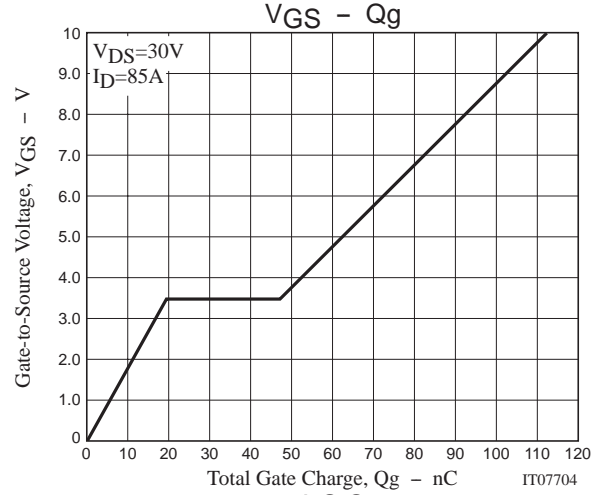
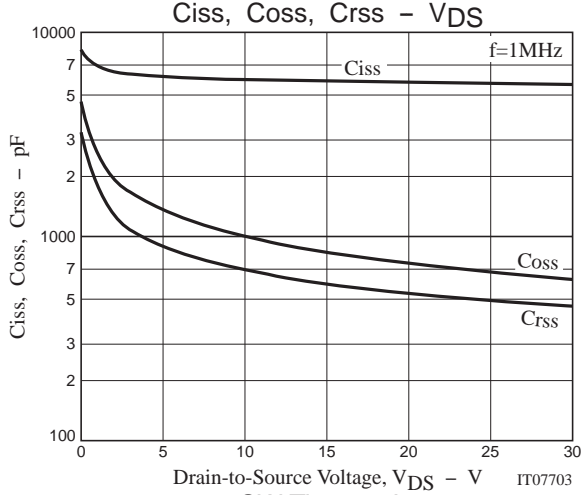
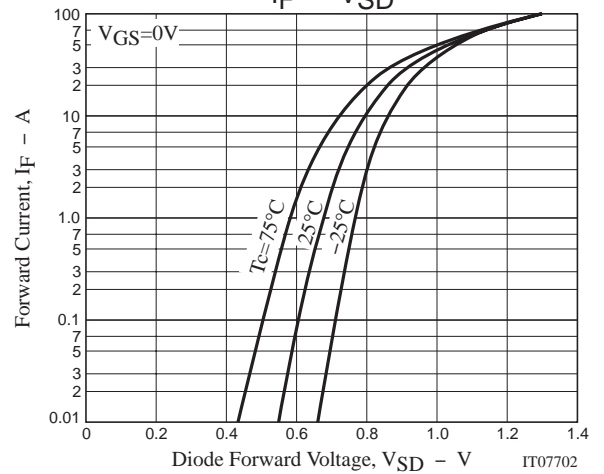
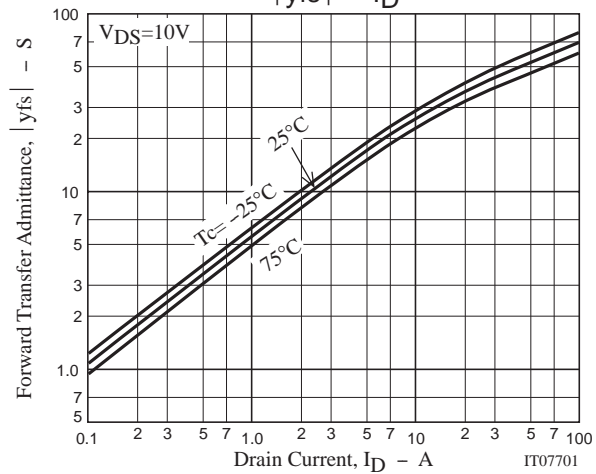
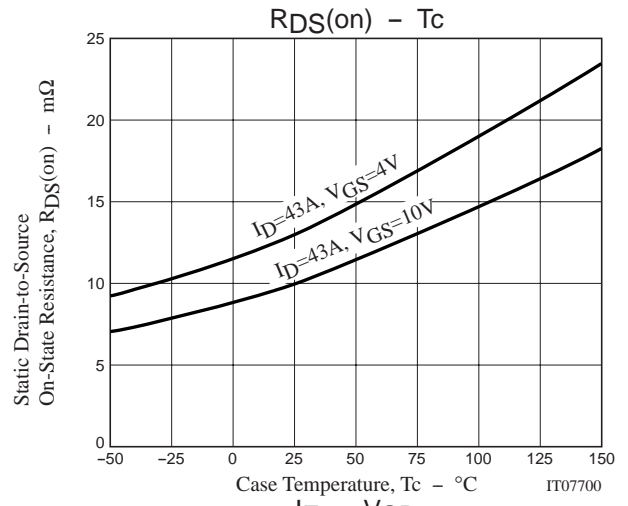
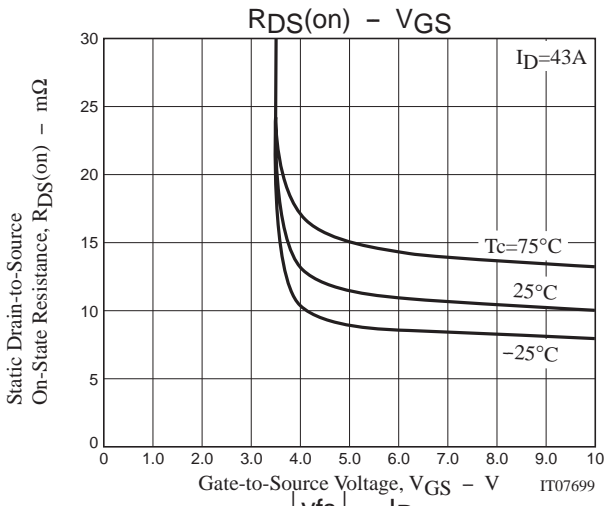
## Switching Time Test Circuit

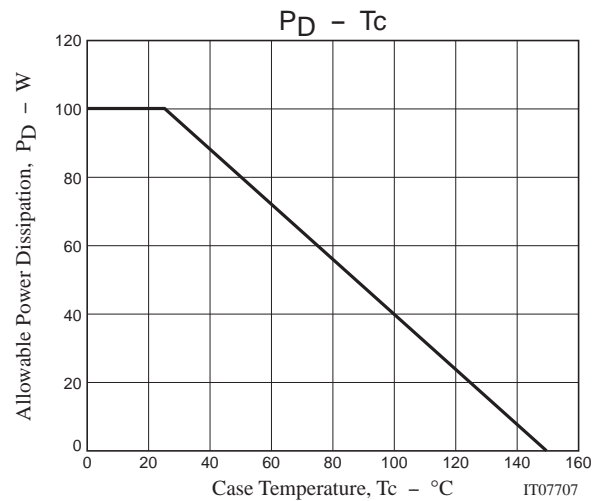
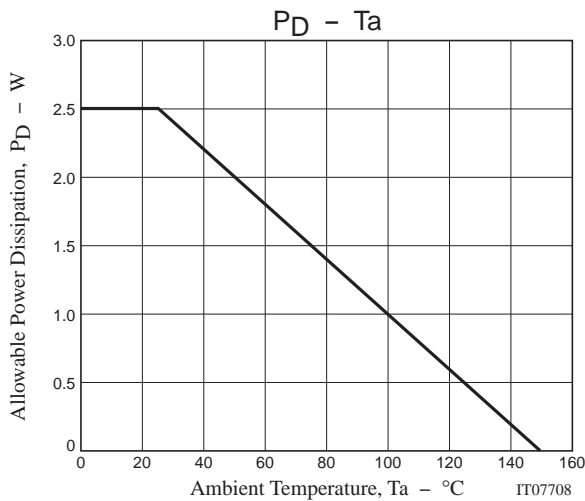


## Unclamped Inductive Circuit



# 2SK3831





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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