



# 2SK3706 — N-Channel Silicon MOSFET

## General-Purpose Switching Device Applications

### Features

- Low ON-resistance.
- 4V drive.
- Motor driver, 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>		100	V
Gate-to-Source Voltage	V <sub>GSS</sub>		±20	V
Drain Current (DC)	I <sub>D</sub>		12	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	48	A
Allowable Power Dissipation	P <sub>D</sub>		2.0	W
		T <sub>c</sub> =25°C	20	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>		18	mJ
Avalanche Current *2	I <sub>AV</sub>		12	A

\*1 V<sub>DD</sub>=20V, L=200μH, I<sub>AV</sub>=12A

\*2 L≤200μH, single 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	100			V
Zero-Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, 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> =6A	7	10		S
Static Drain-to-Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =6A, V <sub>GS</sub> =10V		100	130	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =6A, V <sub>GS</sub> =4V		120	160	mΩ

Marking : K3706

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# 2SK3706

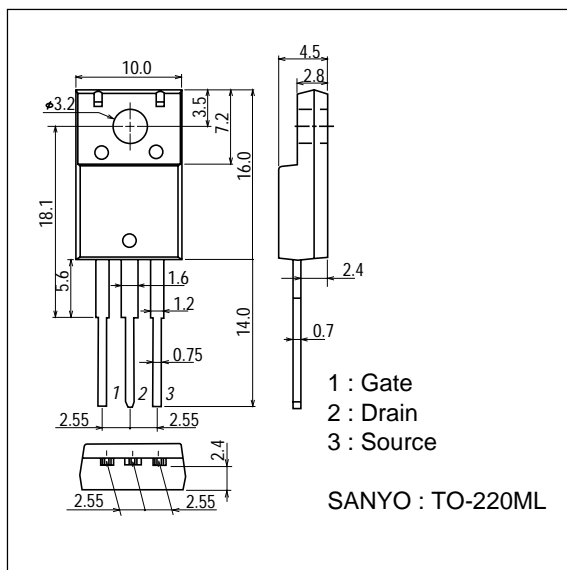
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V <sub>DS</sub> =20V, f=1MHz		880		pF
Output Capacitance	Coss	V <sub>DS</sub> =20V, f=1MHz		80		pF
Reverse Transfer Capacitance	Crss	V <sub>DS</sub> =20V, f=1MHz		55		pF
Turn-ON Delay Time	t <sub>d(on)</sub>	See specified Test Circuit.		11.5		ns
Rise Time	t <sub>r</sub>	See specified Test Circuit.		16		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>	See specified Test Circuit.		97		ns
Fall Time	t <sub>f</sub>	See specified Test Circuit.		45		ns
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =12A		24		nC
Gate-to-Source Charge	Q <sub>gs</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =12A		3.2		nC
Gate-to-Drain "Miller" Charge	Q <sub>gd</sub>	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>D</sub> =12A		5.5		nC
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =12A, V <sub>GS</sub> =0	0.92		1.2	V

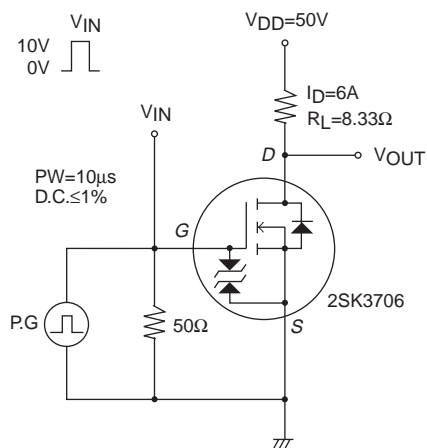
## Package Dimensions

unit : mm

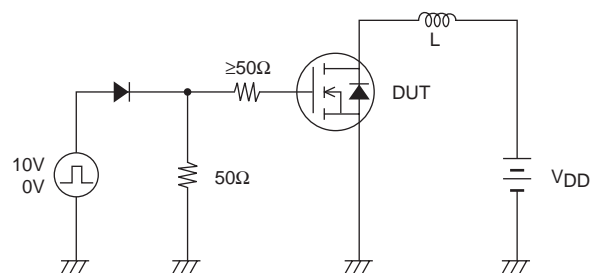
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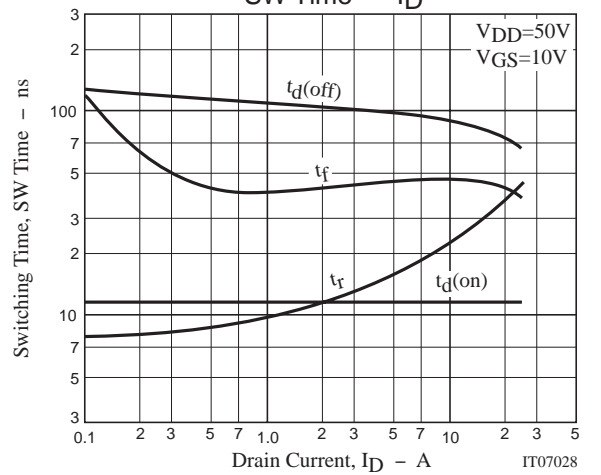
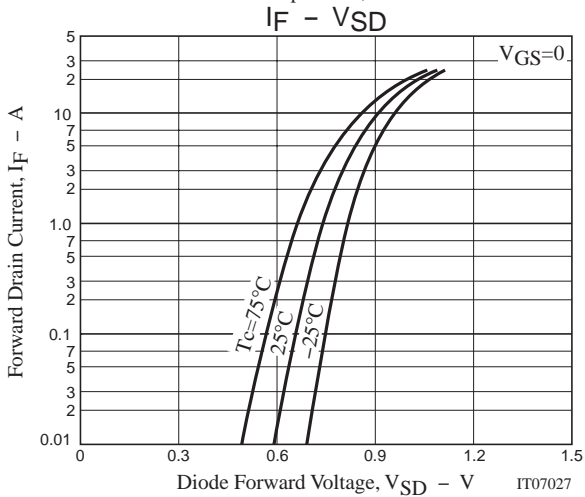
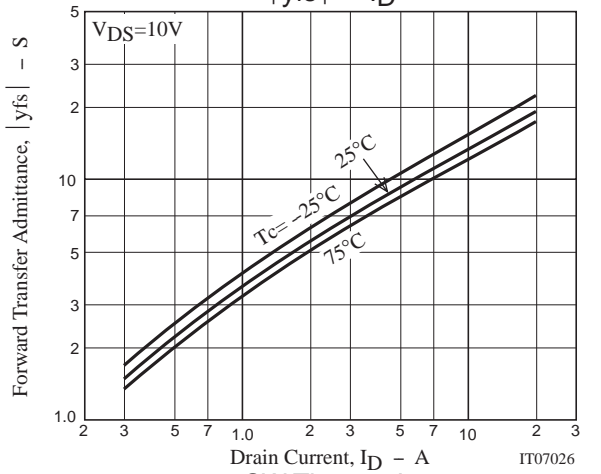
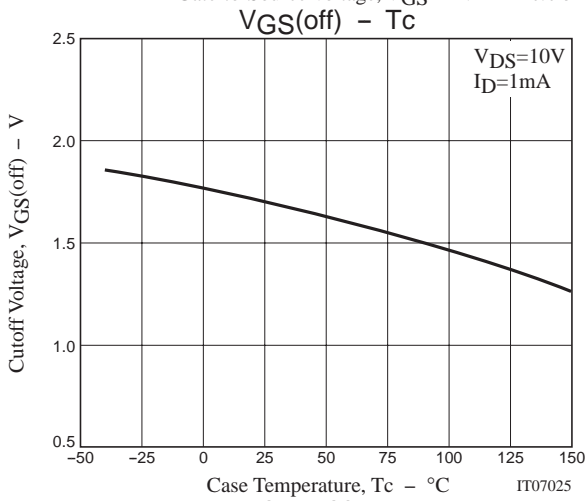
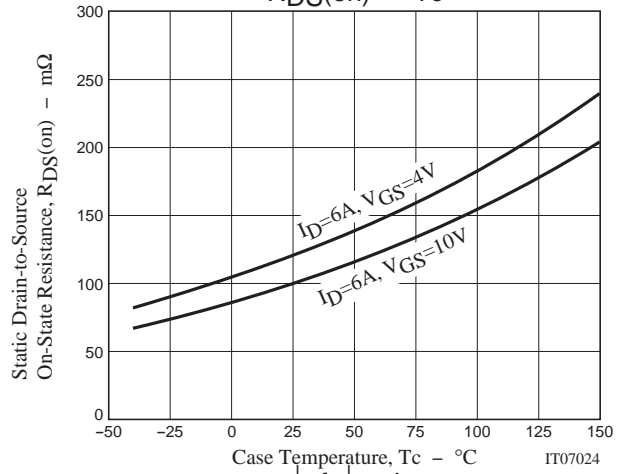
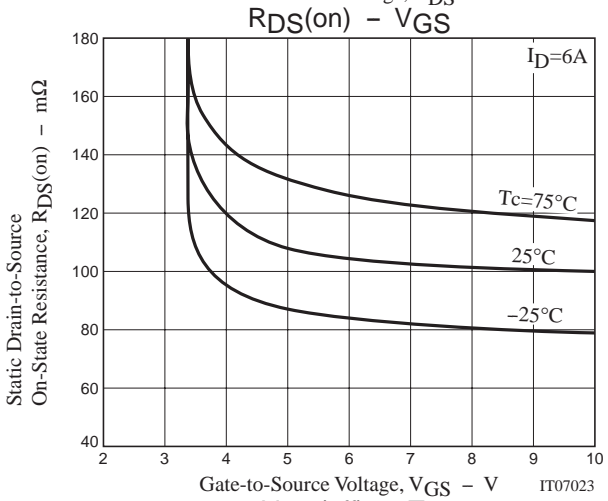
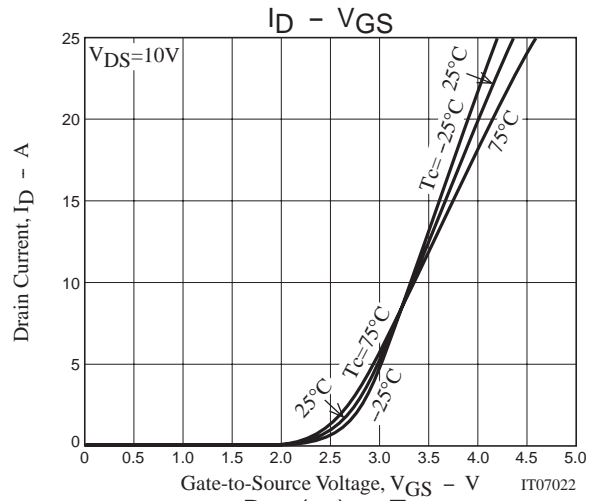
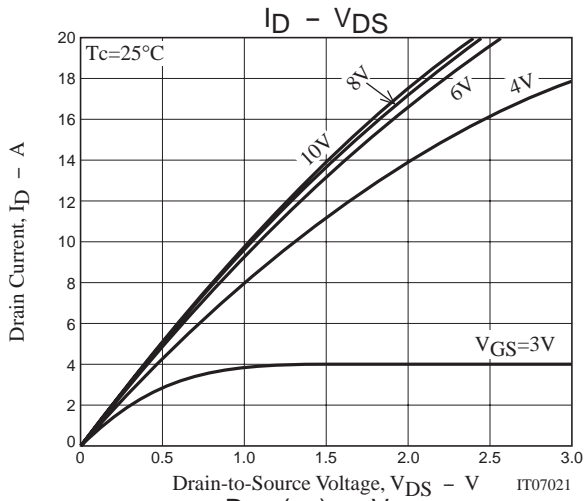
## Switching Time Test Circuit



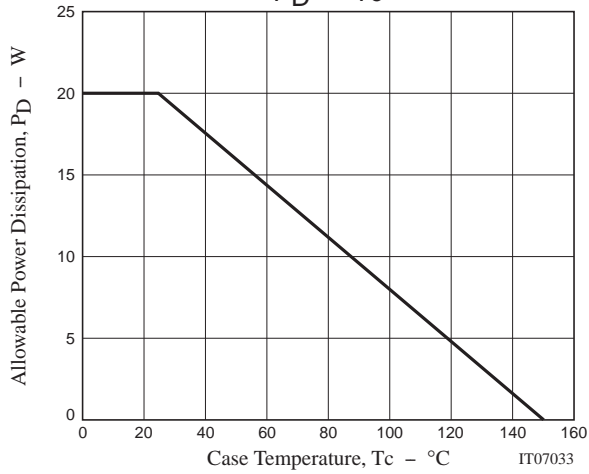
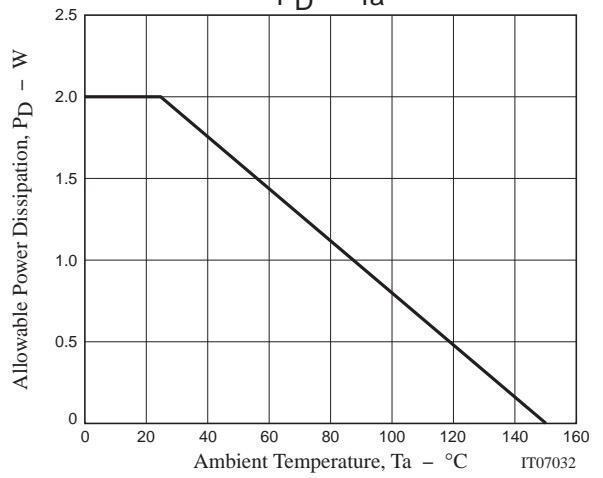
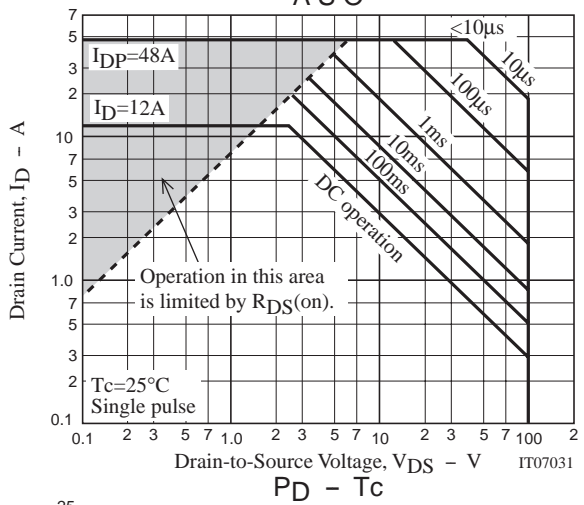
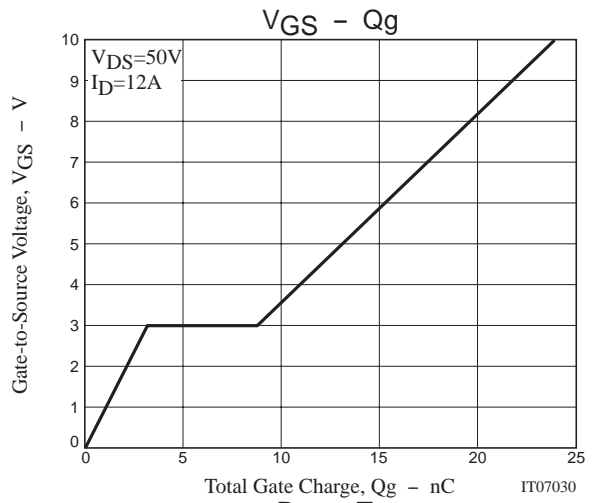
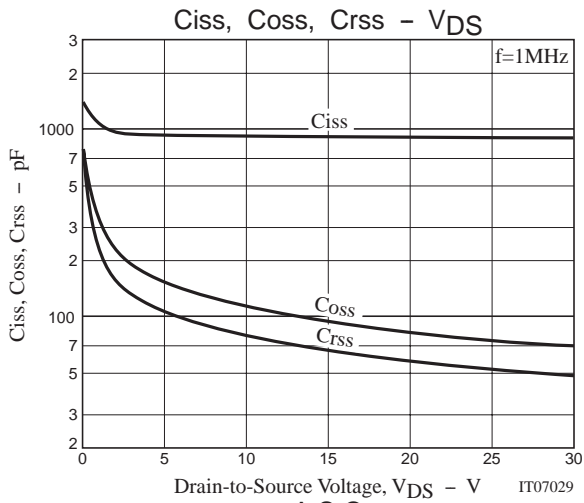
## Unclamped Inductive Test Circuit



# 2SK3706



# 2SK3706



Note on usage : Since the 2SK3706 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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