

# 2SK3704 — N-Channel Silicon MOSFET

## General-Purpose Switching Device Applications

### Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 4V drive.
- Motor drive, DC / DC Converter.

### 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>		45	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	180	A
Allowable Power Dissipation	P <sub>D</sub>		2.0	W
		T <sub>c</sub> =25°C	30	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>		303	mJ
Avalanche Current *2	I <sub>AV</sub>		45	A

\*1 V<sub>DD</sub>=20V, L=200μH, I<sub>AV</sub>=45A

\*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(BR)DSS	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> =23A	22	32		S
Static Drain-to-Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =23A, V <sub>GS</sub> =10V		10.5	14	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =23A, V <sub>GS</sub> =4V		15	21	mΩ

Marking : K3704

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# 2SK3704

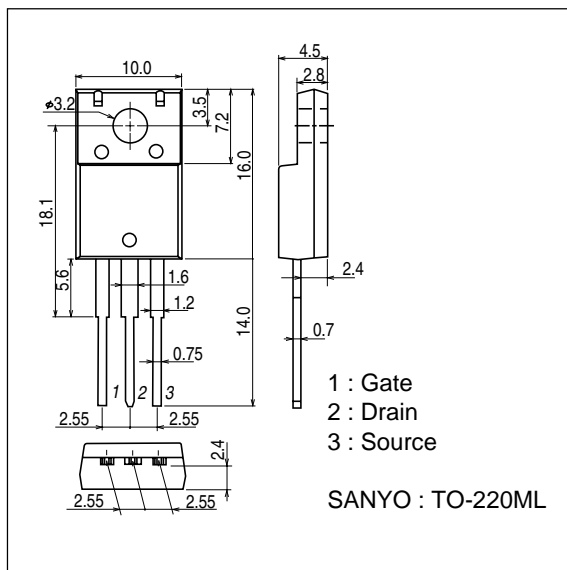
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V <sub>DS</sub> =20V, f=1MHz		3500		pF
Output Capacitance	Coss	V <sub>DS</sub> =20V, f=1MHz		500		pF
Reverse Transfer Capacitance	Crss	V <sub>DS</sub> =20V, f=1MHz		350		pF
Turn-ON Delay Time	t <sub>d(on)</sub>	See specified Test Circuit.		26		ns
Rise Time	t <sub>r</sub>	See specified Test Circuit.		175		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>	See specified Test Circuit.		265		ns
Fall Time	t <sub>f</sub>	See specified Test Circuit.		210		ns
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =45A		67		nC
Gate-to-Source Charge	Q <sub>gs</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =45A		10.6		nC
Gate-to-Drain "Miller" Charge	Q <sub>gd</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =45A		10		nC
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =45A, V <sub>GS</sub> =0		1.0	1.2	V

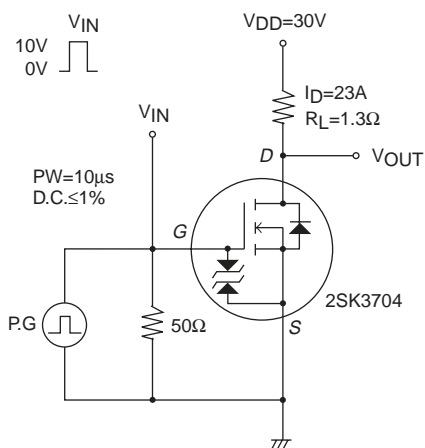
## Package Dimensions

unit : mm

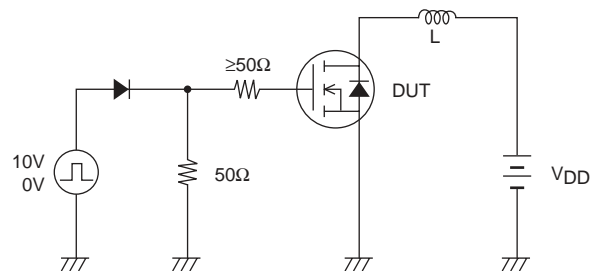
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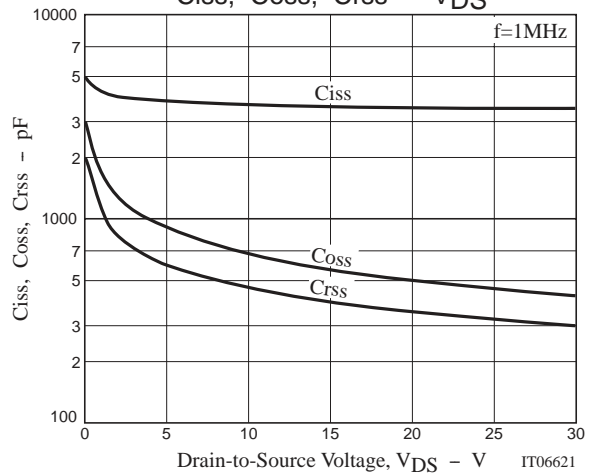
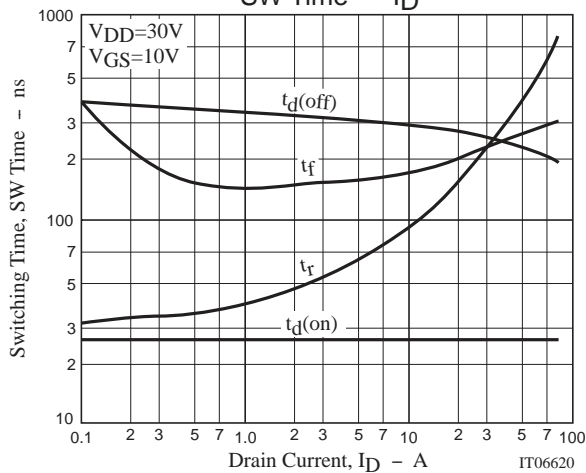
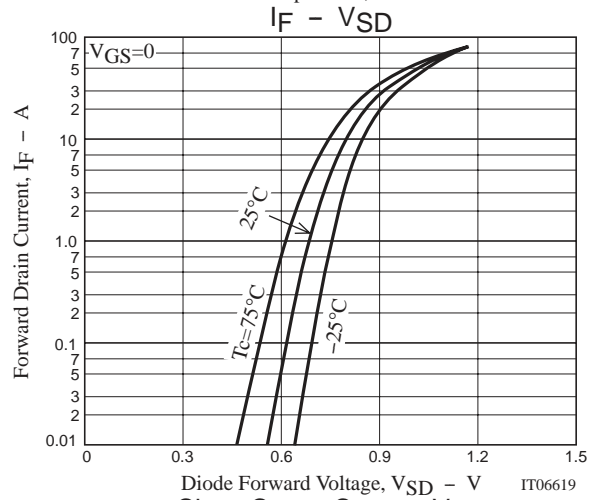
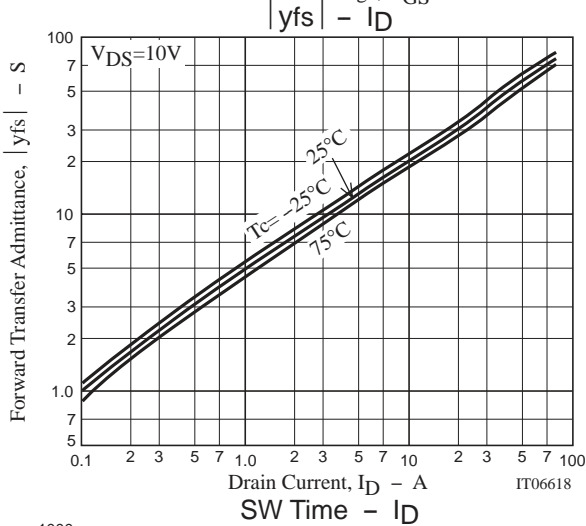
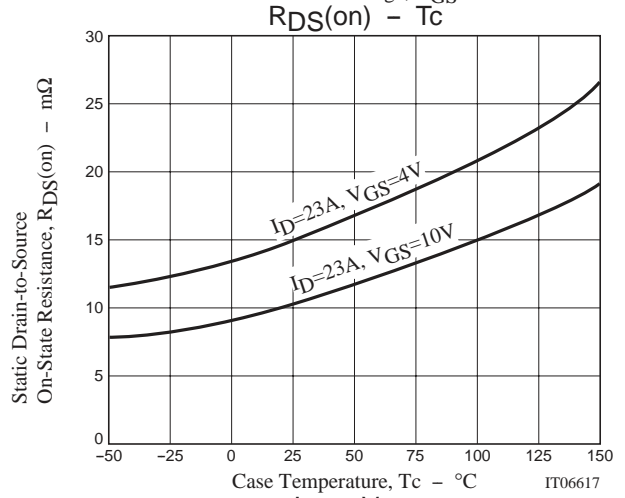
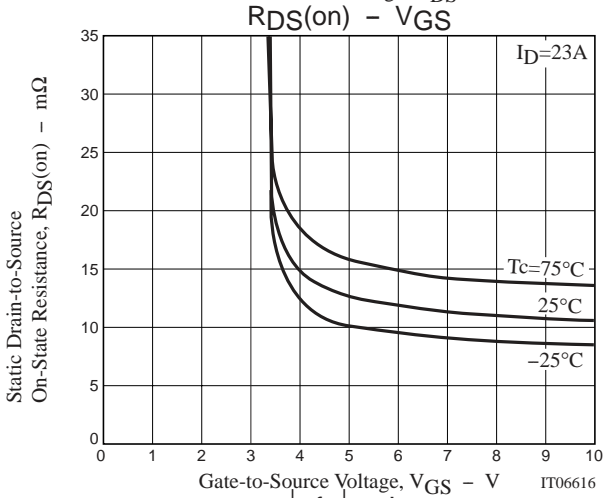
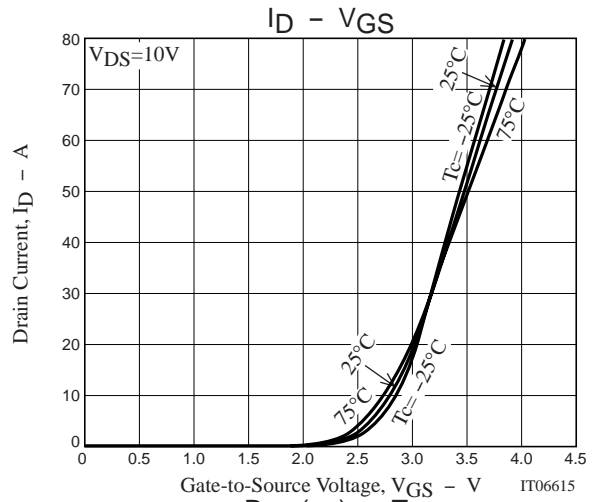
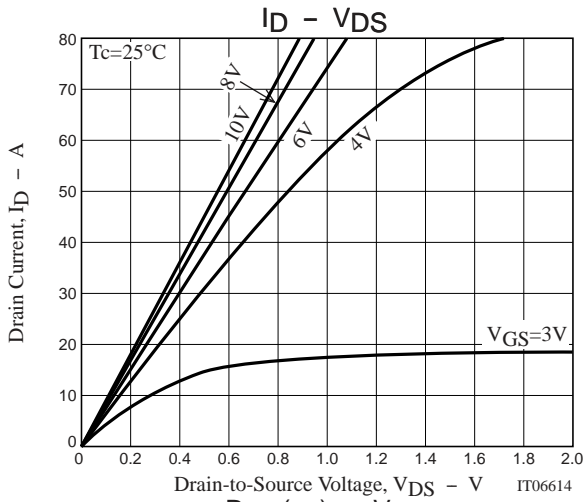
## Switching Time Test Circuit



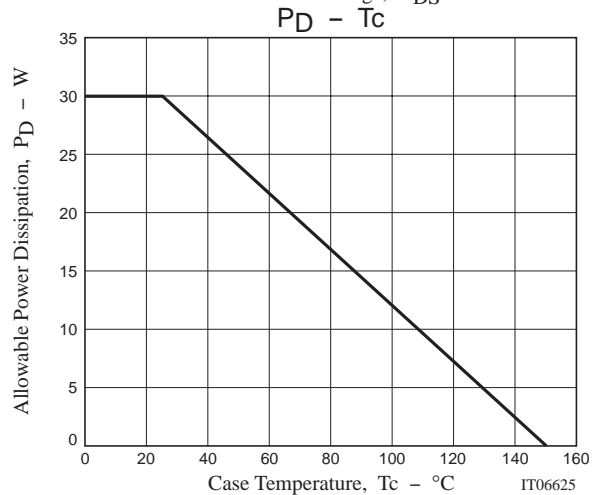
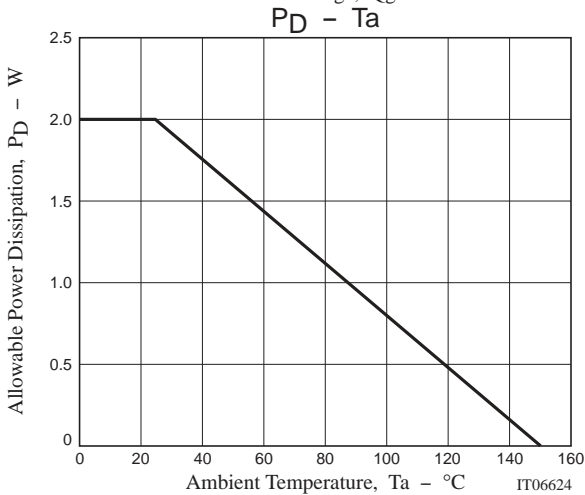
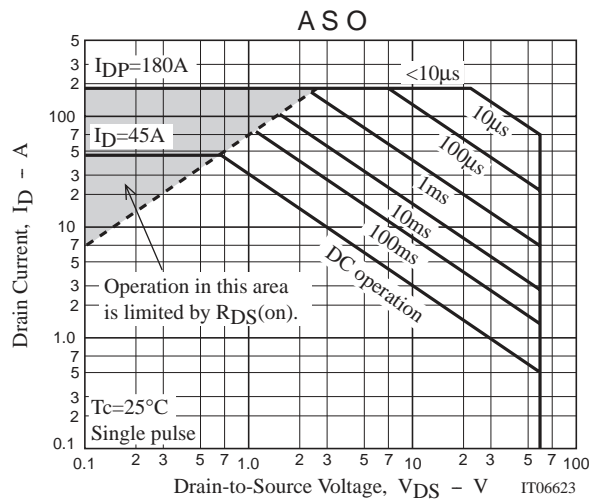
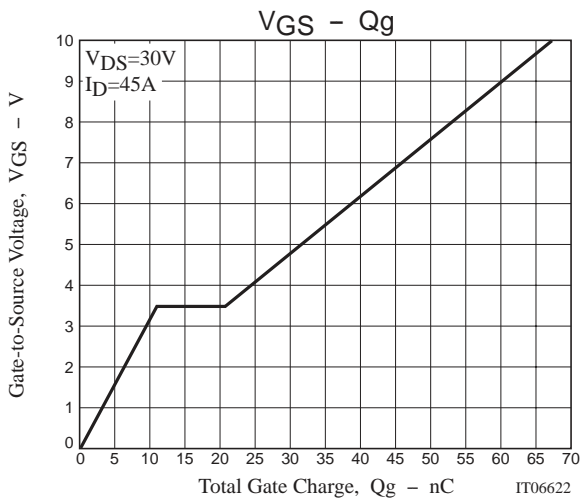
## Unclamped Inductive Test Circuit



# 2SK3704



## 2SK3704



Note on usage : Since the 2SK3704 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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