



# 2SK3705 — N-Channel Silicon MOSFET

## General-Purpose Switching Device Applications

### Features

- Low ON-resistance.
- Ultrahigh-speed switching.
- 4V drive.
- Motor driver, 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	$V_{DSS}$		60	V
Gate-to-Source Voltage	$V_{GSS}$		$\pm 20$	V
Drain Current (DC)	$I_D^*$		60	A
Drain Current (Pulse)	$I_{DP}$	$PW \leq 10\mu\text{s}$ , duty cycle $\leq 1\%$	208	A
Allowable Power Dissipation	$P_D$		2.0	W
		$T_c=25^\circ\text{C}$	35	W
Channel Temperature	$T_{ch}$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$
Avalanche Energy (Single Pulse) *1	$E_{AS}$		540	mJ
Avalanche Current *2	$I_{AV}$		60	A

\*Shows Chip Capability

\*1  $V_{DD}=20\text{V}$ ,  $I_{AV}=60\text{A}$ ,  $L=200\mu\text{H}$

\*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	$V_{(BR)DSS}$	$I_D=1\text{mA}$ , $V_{GS}=0$	60			V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60\text{V}$ , $V_{GS}=0$			1	$\mu\text{A}$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS} = \pm 16\text{V}$ , $V_{DS}=0$			$\pm 10$	$\mu\text{A}$
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} $	$V_{DS}=10\text{V}$ , $I_D=26\text{A}$	28	40		S
Static Drain-to-Source On-State Resistance	$R_{DS(on)1}$	$I_D=26\text{A}$ , $V_{GS}=10\text{V}$		9.0	12.5	$\text{m}\Omega$
	$R_{DS(on)2}$	$I_D=26\text{A}$ , $V_{GS}=4\text{V}$		12	17	$\text{m}\Omega$

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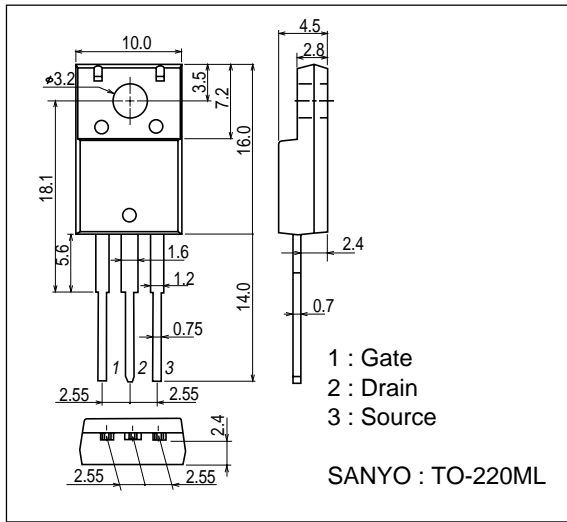
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Input Capacitance	Ciss	V <sub>DS</sub> =20V, f=1MHz		5500		pF
Output Capacitance	Coss	V <sub>DS</sub> =20V, f=1MHz		750		pF
Reverse Transfer Capacitance	Crss	V <sub>DS</sub> =20V, f=1MHz		550		pF
Turn-ON Delay Time	t <sub>d(on)</sub>	See specified Test Circuit.		38		ns
Rise Time	t <sub>r</sub>	See specified Test Circuit.		215		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>	See specified Test Circuit.		380		ns
Fall Time	t <sub>f</sub>	See specified Test Circuit.		280		ns
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =52A		100		nC
Gate-to-Source Charge	Q <sub>gs</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =52A		18		nC
Gate-to-Drain "Miller" Charge	Q <sub>gd</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =52A		16		nC
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =52A, V <sub>GS</sub> =0		1.0	1.2	V

Marking : K3705

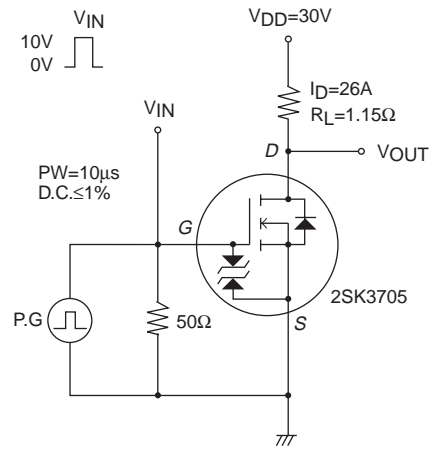
## Package Dimensions

unit : mm

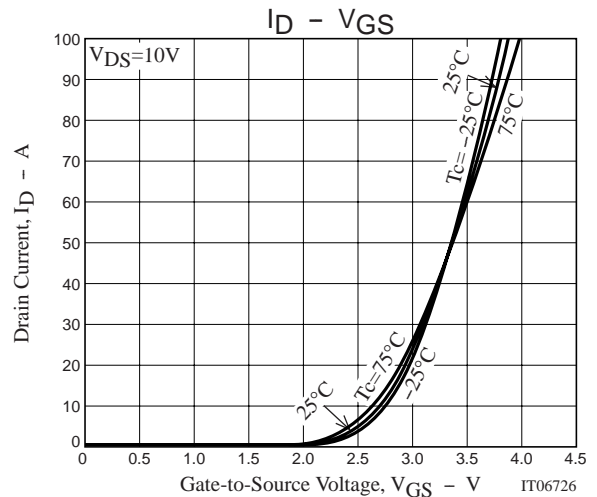
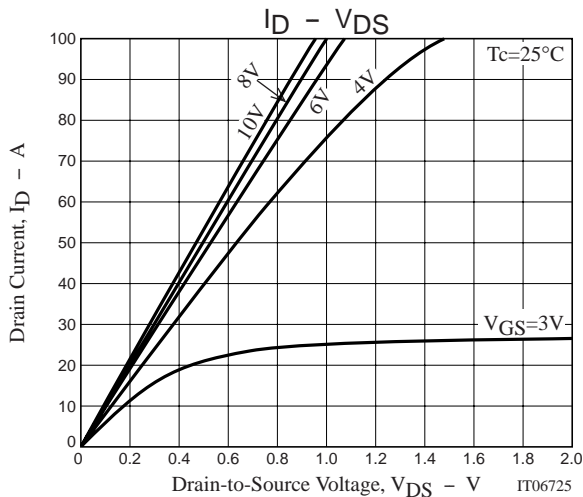
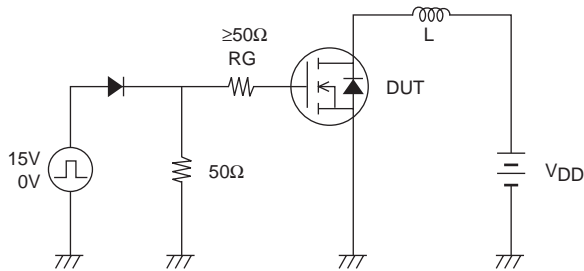
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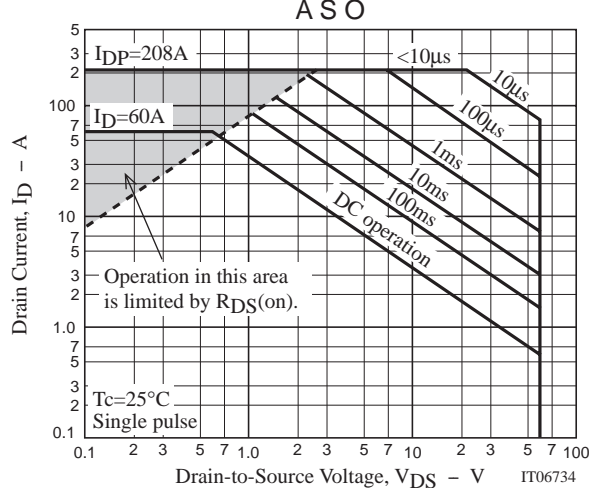
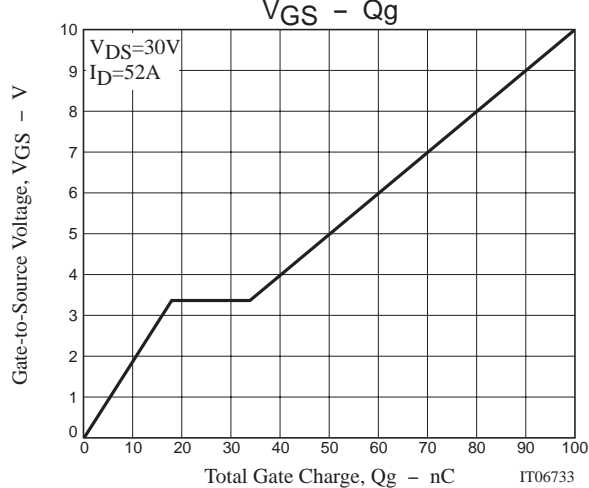
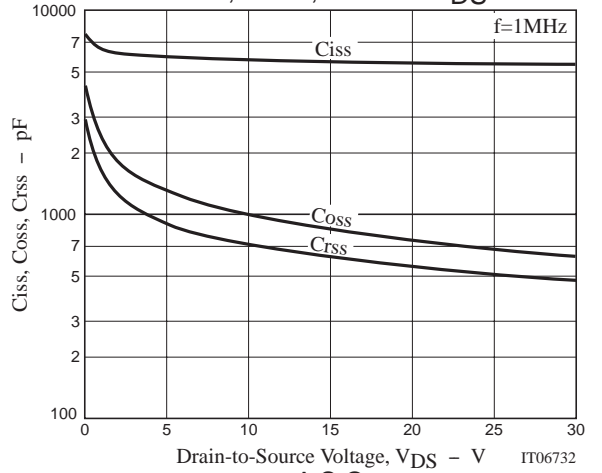
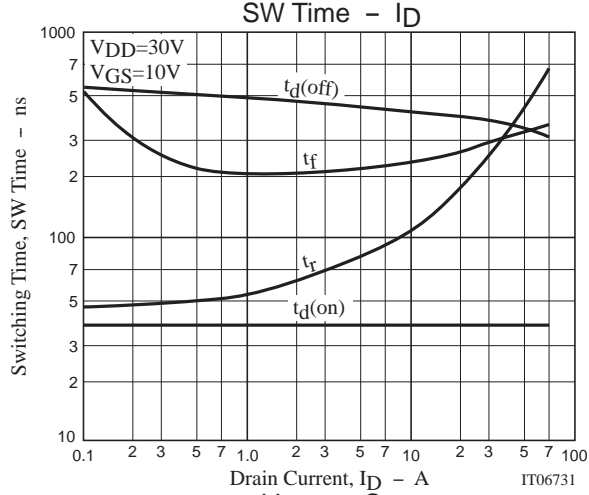
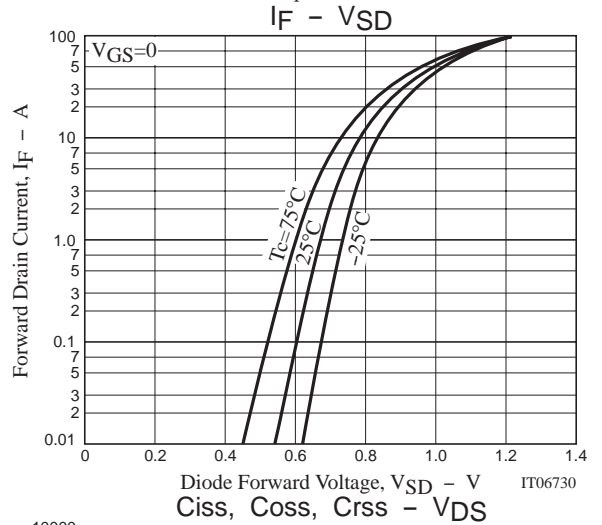
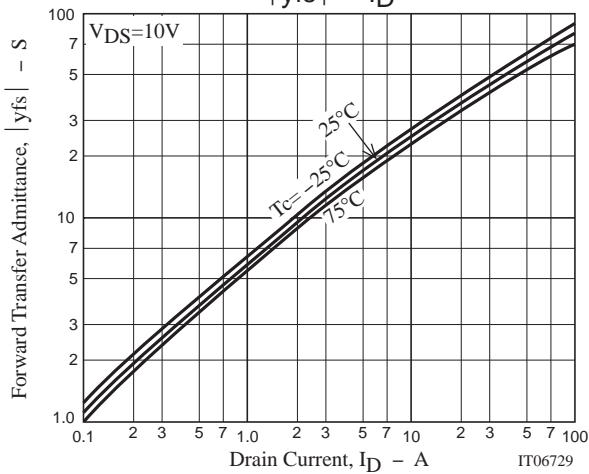
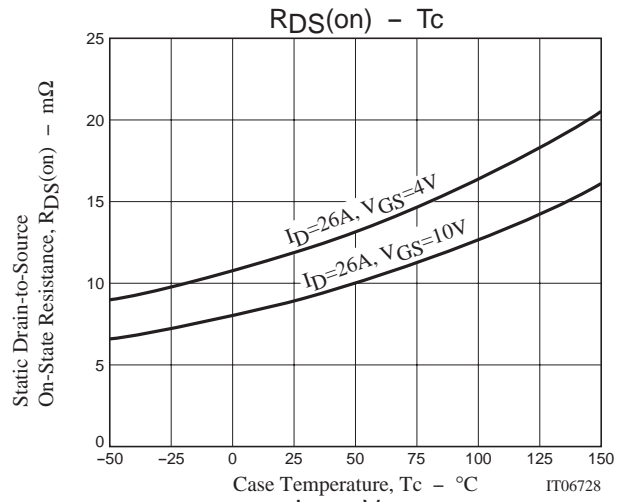
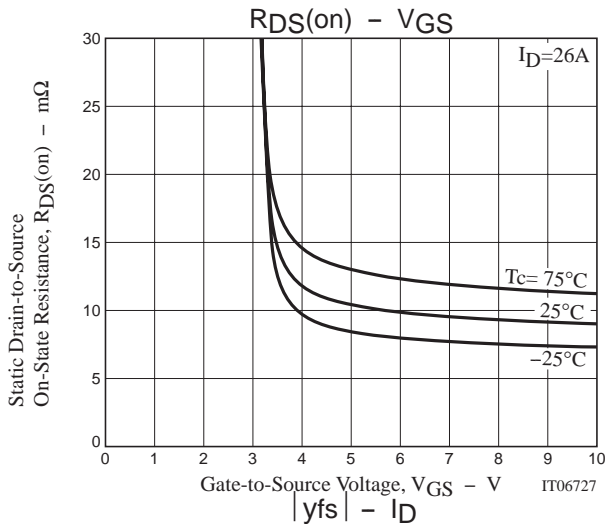
## Switching Time Test Circuit

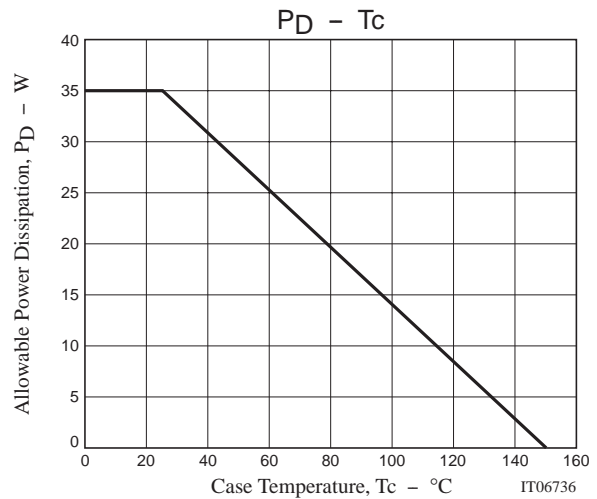
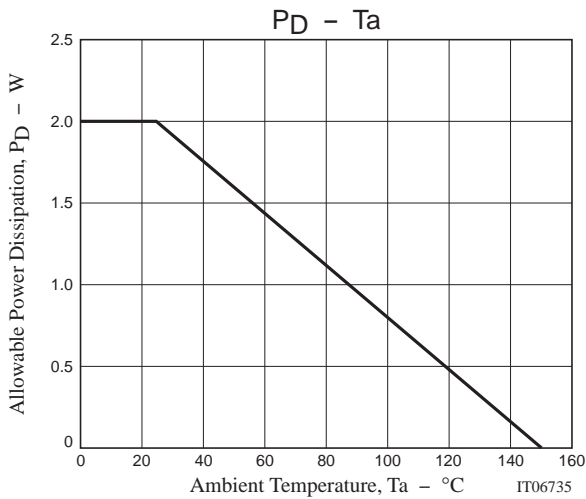


## Unclamped Inductive Test Circuit



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