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SANYO Semiconductors

# DATA SHEET

## 2SK3824 — 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>		60	A
Drain Current (Pulse)	I <sub>DP</sub>	PW≤10μs, duty cycle≤1%	240	A
Allowable Power Dissipation	P <sub>D</sub>		1.75	W
		T <sub>c</sub> =25°C	60	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>		125	mJ
Avalanche Current *2	I <sub>AV</sub>		60	A

Note : \*1 V<sub>DD</sub>=20V, L=50μH, I<sub>AV</sub>=60A

\*2 L≤50μH, 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	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> =30A	24	40		S
Static Drain-to-Source On-State Resistance	R <sub>DS(on)1</sub>	I <sub>D</sub> =30A, V <sub>GS</sub> =10V		11.5	15	mΩ
	R <sub>DS(on)2</sub>	I <sub>D</sub> =30A, V <sub>GS</sub> =4V		16	22	mΩ

Marking : K3824

Continued on next page.

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## 2SK3824

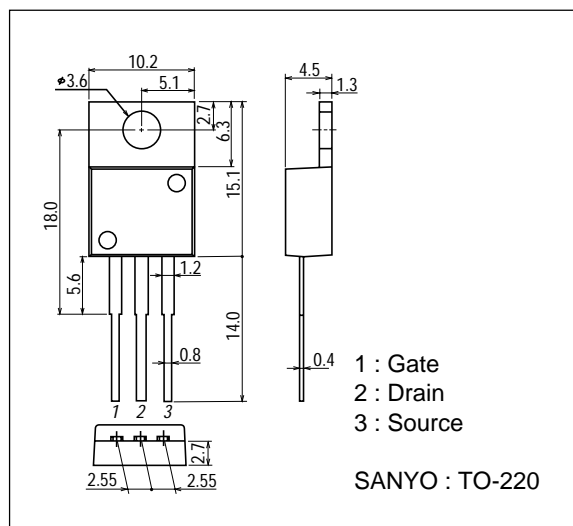
Continued from preceding page.

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.		230		ns
Turn-OFF Delay Time	t <sub>d(off)</sub>	See specified Test Circuit.		255		ns
Fall Time	t <sub>f</sub>	See specified Test Circuit.		230		ns
Total Gate Charge	Qg	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =60A		67		nC
Gate-to-Source Charge	Qgs	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =60A		10.6		nC
Gate-to-Drain "Miller" Charge	Qgd	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =60A		10		nC
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =60A, V <sub>GS</sub> =0		1.07	1.5	V

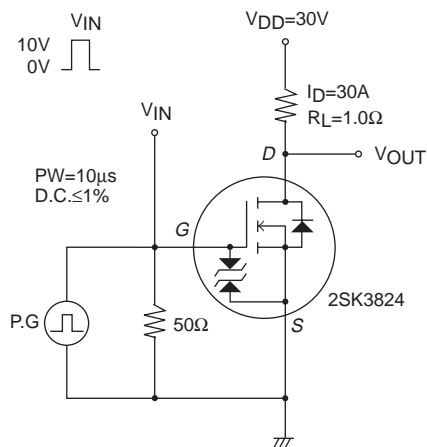
### Package Dimensions

unit : mm

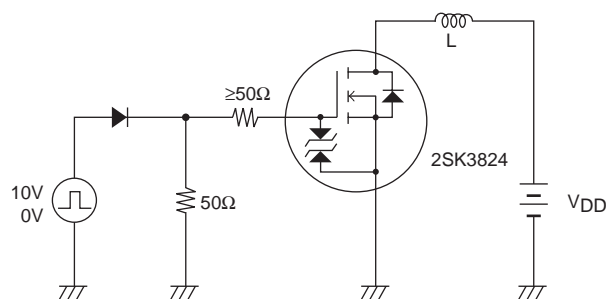
2052C



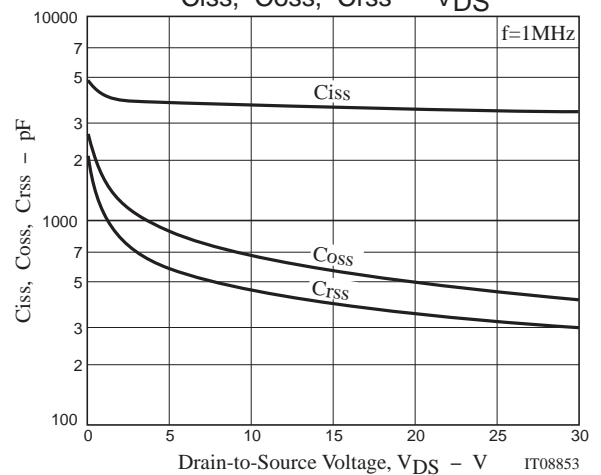
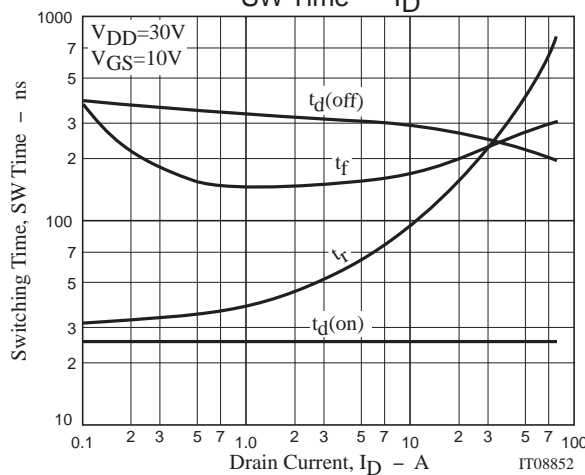
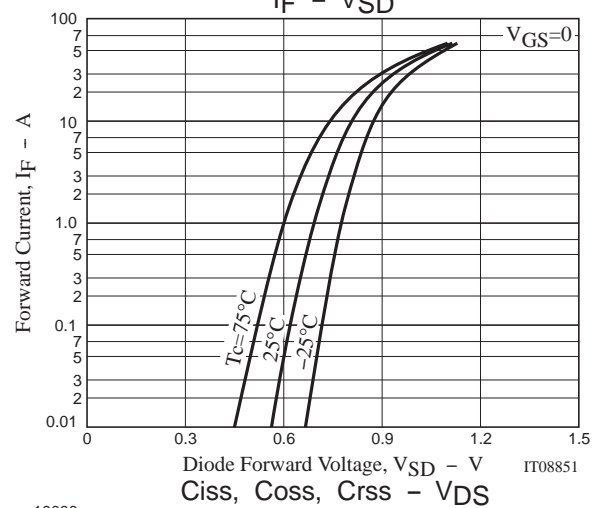
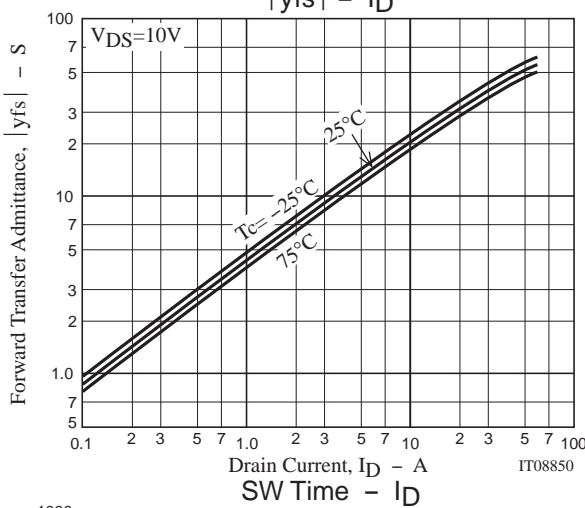
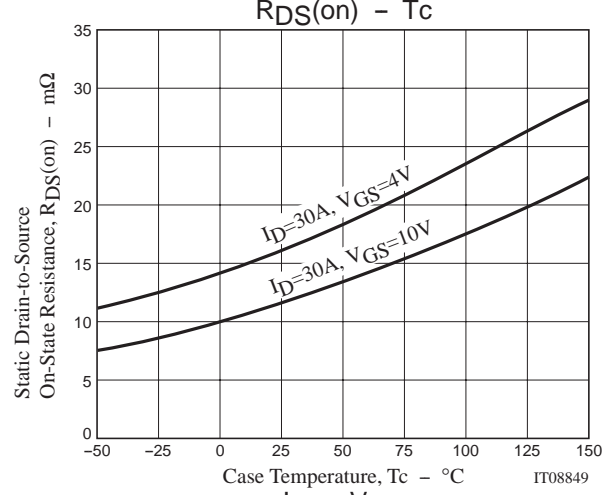
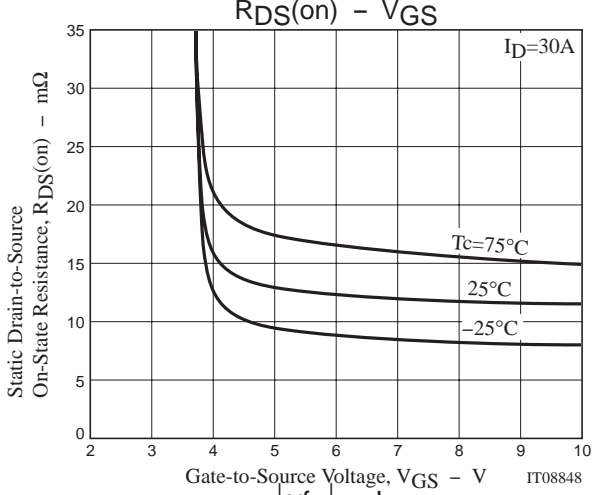
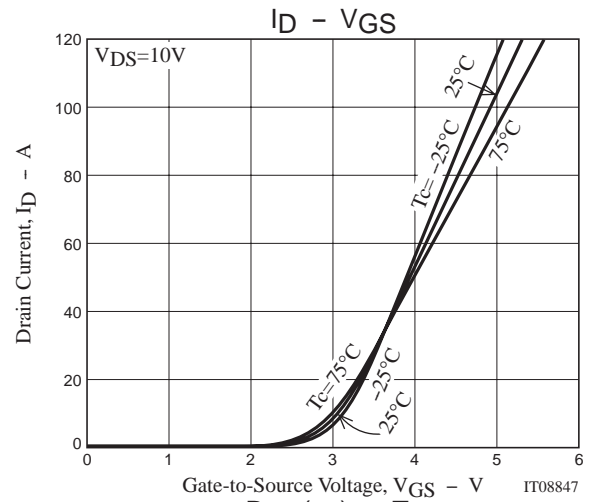
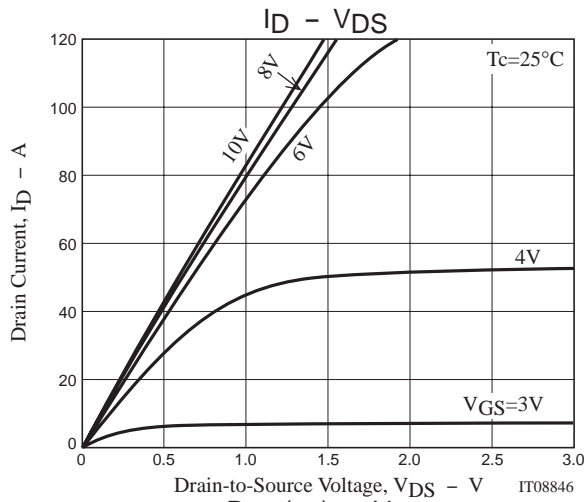
### Switching Time Test Circuit



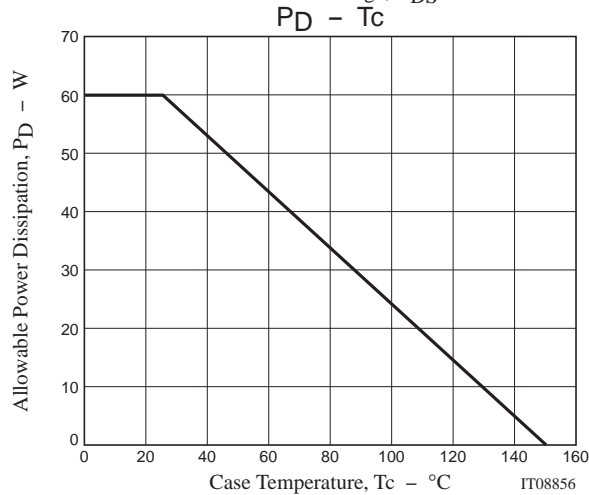
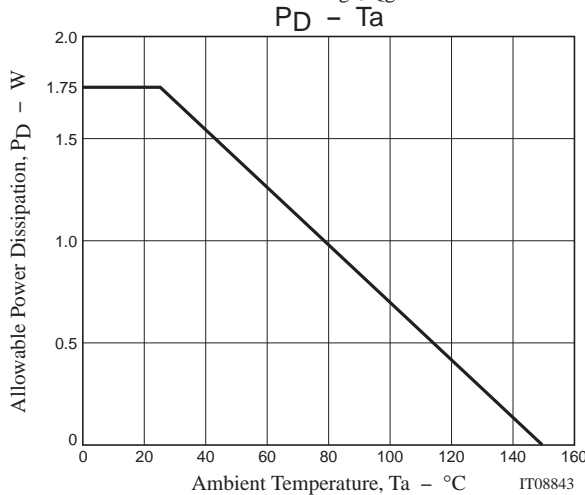
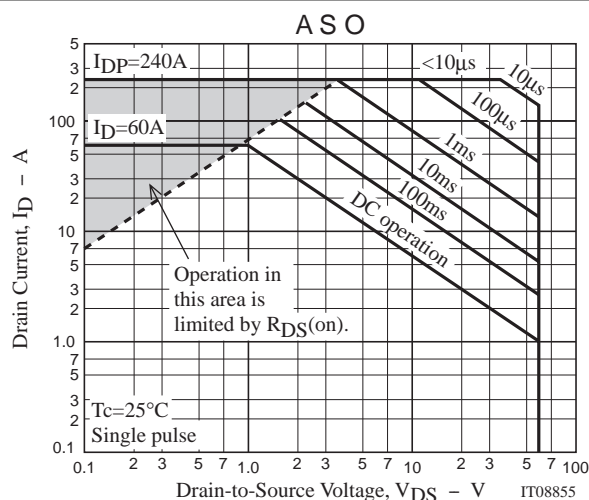
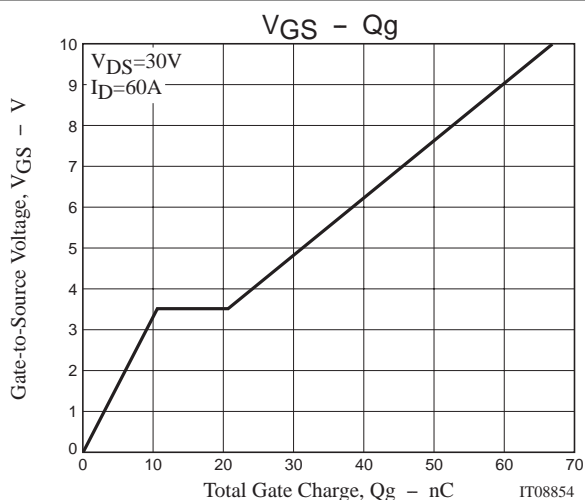
### Avalanche Resistance Test Circuit



**2SK3824**



## 2SK3824



Note on usage : Since the 2SK3824 is a MOSFET product, please avoid using this device in the vicinity of highly charged objects.

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