

Switching (450V, 5A)

2SK2713

●Features

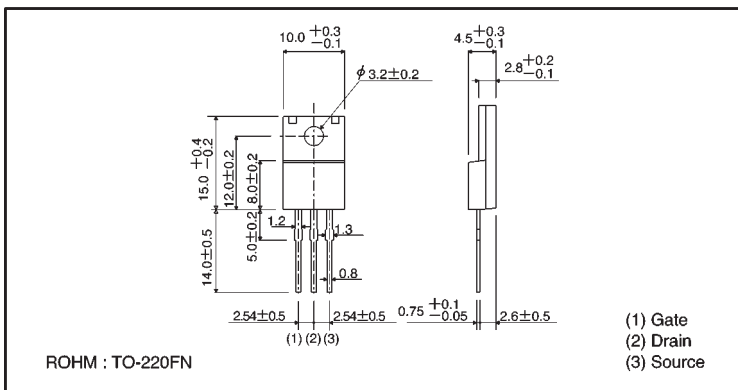
- 1) Low on-resistance.
- 2) Fast switching speed.
- 3) Wide SOA (safe operating area).
- 4) Gate-source voltage (V_{GS}) guaranteed to be $\pm 30V$.
- 5) Easily designed drive circuits.
- 6) Easy to parallel.

●Structure

Silicon N-channel

MOSFET

●External dimensions (Units: mm)



●Absolute maximum ratings ($T_a = 25^\circ C$)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DS}	450	V
Gate-source voltage		V_{GS}	± 30	V
Drain current	Continuous	I_D	5	A
	Pulsed	I_{DP}^*	20	A
Reverse drain current	Continuous	I_{DR}	5	A
	Pulsed	I_{DRP}^*	20	A
Total power dissipation ($T_c=25^\circ C$)		P_D	30	W
Channel temperature		T_{ch}	150	$^\circ C$
Storage temperature		T_{stg}	$-55 \sim +150$	$^\circ C$

* $P_w \leq 10 \mu s$, Duty cycle $\leq 1\%$

●Packaging specifications

Type	Package	Bulk
	Code	—
	Basic ordering unit (pieces)	500
2SK2713		○

●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate-source leakage	IGSS	—	—	±100	nA	VGS=±30V, VDS=0V
Drain-source breakdown voltage	V(BR)DSS	450	—	—	V	ID=1mA, VGS=0V
Zero gate voltage drain current	IDSS	—	—	100	μA	VDS=450V, VGS=0V
Gate threshold voltage	VGS(th)	2.0	—	4.0	V	VDS=10V, ID=1mA
Static drain-source on-state resistance	RDS(on)	—	1.0	1.4	Ω	ID=2.5A, VGS=10V
Forward transfer admittance	Yfs	1.0	3.0	—	S	ID=2.5A, VDS=10V
Input capacitance	Ciss	—	600	—	pF	VDS=10V
Output capacitance	Coss	—	135	—	pF	VGS=0V
Reverse transfer capacitance	Crss	—	53	—	pF	f=1MHz
Turn-on delay time	td(on)	—	14	—	ns	ID=2.5A, VDD≒150V
Rise time	tr	—	17	—	ns	VGS=10V
Turn-off delay time	td(off)	—	50	—	ns	RL=60Ω
Fall time	tf	—	35	—	ns	RG=10Ω
Reverse recovery time	trr	—	300	—	ns	IDR=5A, VGS=0V
Reverse recovery charge	Qrr	—	1.8	—	μC	di/dt=100A/μs

●Electrical characteristic curves

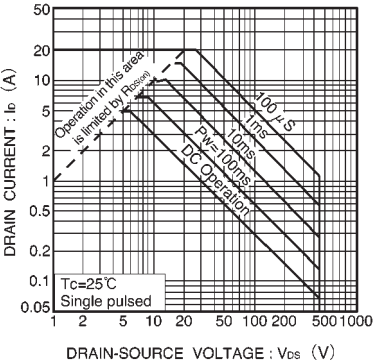


Fig.1 Maximum safe operating area

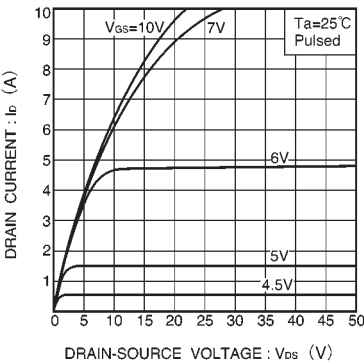


Fig.2 Typical output characteristics

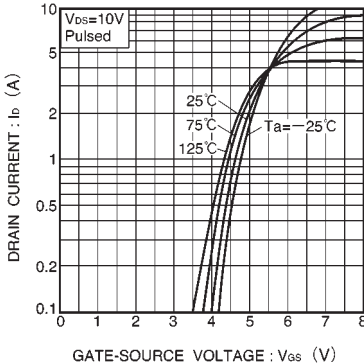


Fig.3 Typical transfer characteristics

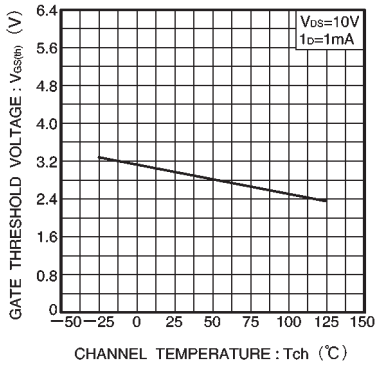


Fig.4 Gate threshold voltage vs. channel temperature

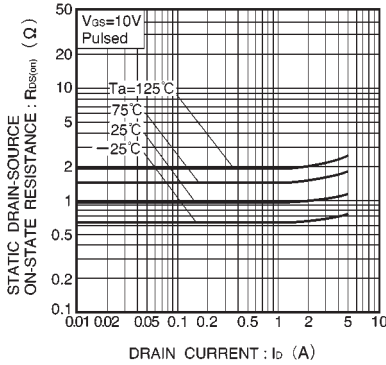


Fig.5 Static drain-source on-state resistance vs. drain current

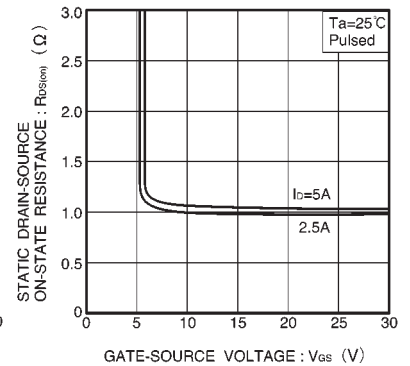


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

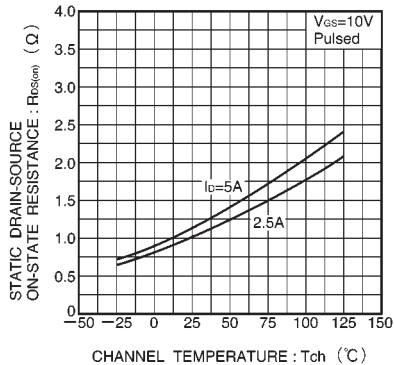


Fig.7 Static drain-source on-state resistance vs. channel temperature

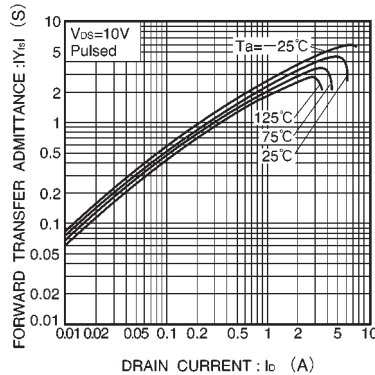


Fig.8 Forward transfer admittance vs. drain current

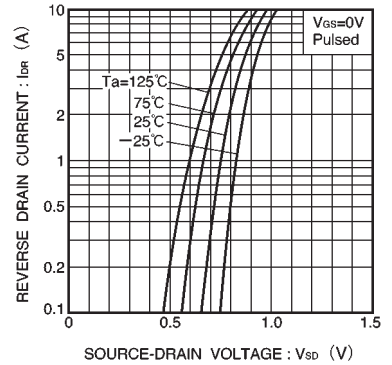


Fig.9 Reverse drain current vs. source-drain voltage

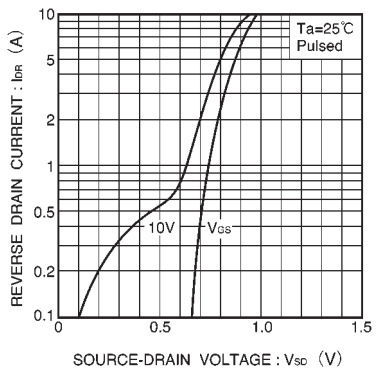


Fig.10 Reverse drain current vs. source-drain voltage

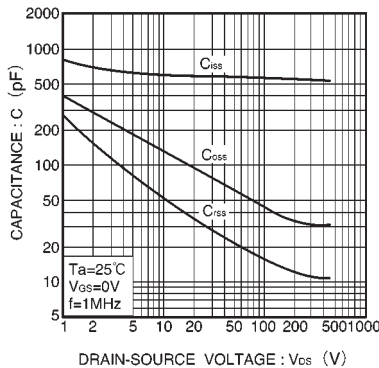


Fig.11 Typical capacitance vs. drain-source voltage

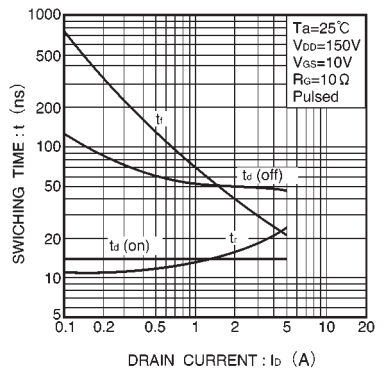


Fig.12 Switching characteristics (See Figures 16 and 17 for the measurement circuit and resultant waveforms)

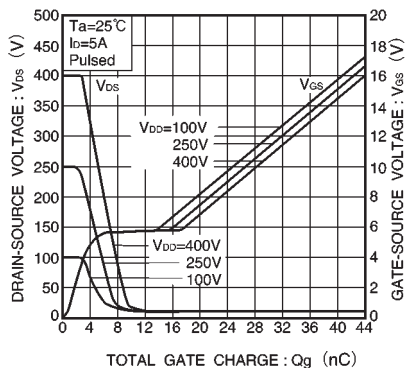


Fig.13 Dynamic input characteristics
(See Figure. 18 for measurement circuit)

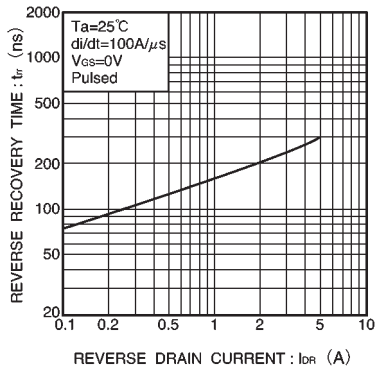


Fig.14 Reverse recovery time
vs. reverse drain current

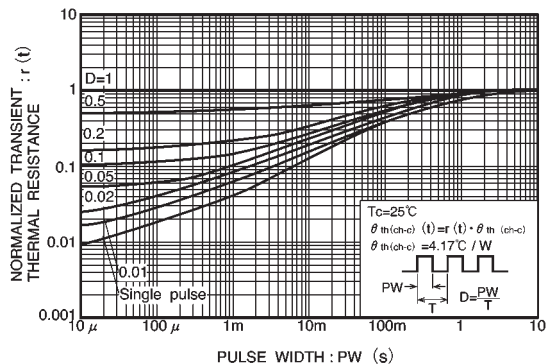


Fig.15 Normalized transient thermal
resistance vs. pulse width

● Switching characteristics measurement circuit

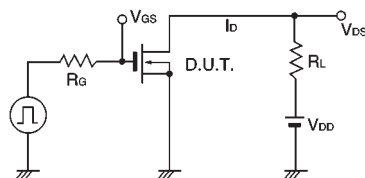


Fig.16 Switching time measurement circuit

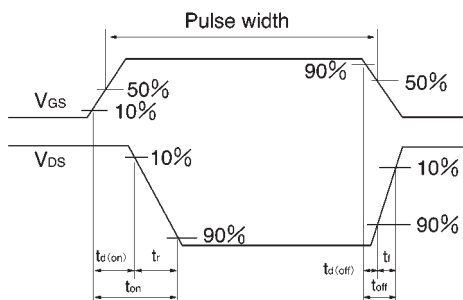


Fig.17 Switching time waveforms

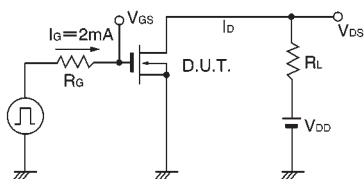


Fig.18 Gate charge measurement circuit