Switching (500V, 10A)
2SK2714
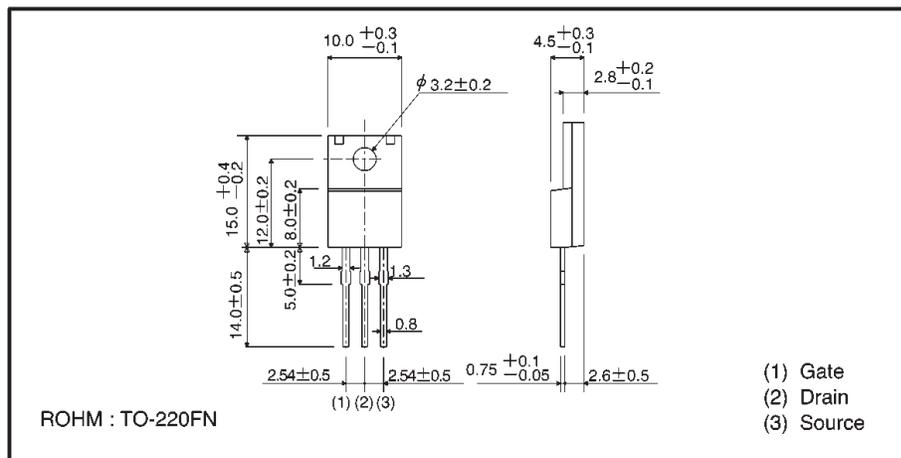
●Features
1) Low on-resistance.
2) Fast switching speed.
3) Wide SOA (safe operating area).
4) Gate-source voltage (V_{GSS}) guaranteed to be ±30V.
5) Easily designed drive circuits.
6) Easy to parallel.

●Structure
Silicon N-channel
MOSFET

●External dimensions (Units: mm)

ROHM : TO-220FN

(1) Gate
(2) Drain
(3) Source

●Absolute maximum ratings (Ta = 25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	500	V
Gate-source voltage		V_{GSS}	±30	V
Drain current	Continuous	I_D	10	A
	Pulsed	I_{DP}*	40	A
Reverse drain current	Continuous	I_{DR}	10	A
	Pulsed	I_{DRP}*	40	A
Total power dissipation (Tc=25°C)		P_D	30	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	−55～+150	°C

＊ Pw≦10μs, Duty cycle≦1%

●Packaging specifications

	Package	Bulk
Type	Code	—
	Basic ordering unit (pieces)	500
2SK2714		○

138

ROHM

●Electrical characteristics (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate-source leakage	I_{GSS}	—	—	±100	nA	$V_{GS}=\pm30V$, $V_{DS}=0V$
Drain-source breakdown voltage	$V_{(BR)DSS}$	500	—	—	V	$I_D=1mA$, $V_{GS}=0V$
Zero gate voltage drain current	I_{DSS}	—	—	100	μA	$V_{DS}=500V$, $V_{GS}=0V$
Gate threshold voltage	$V_{GS(th)}$	2.0	—	4.0	V	$V_{DS}=10V$, $I_D=1mA$
Static drain-source on-state resistance	$R_{DS(on)}$	—	0.75	0.9	Ω	$I_D=5A$, $V_{GS}=10V$
Forward transfer admittance	$\lvert Y_{fs} \rvert$*	3.0	6.5	—	S	$I_D=5A$, $V_{DS}=10V$
Input capacitance	C_{iss}	—	1060	—	pF	$V_{DS}=10V$
Output capacitance	C_{oss}	—	235	—	pF	$V_{GS}=0V$
Reverse transfer capacitance	C_{rss}	—	93	—	pF	$f=1MHz$
Turn-on delay time	$t_{d(on)}$	—	19	—	ns	$I_D=5A$, $V_{DD}\fallingdotseq150V$
Rise time	t_r	—	26	—	ns	$V_{GS}=10V$
Turn-off delay time	$t_{d(off)}$	—	78	—	ns	$R_L=30\Omega$
Fall time	t_f	—	26	—	ns	$R_G=10\Omega$
Reverse recovery time	t_{rr}	—	560	—	ns	$I_{DR}=10A$, $V_{GS}=0V$
Reverse recovery charge	Q_{rr}	—	5	—	μC	$di/dt=100A/\mu s$

* Pw≦300 μs, Duty cycle≦1%
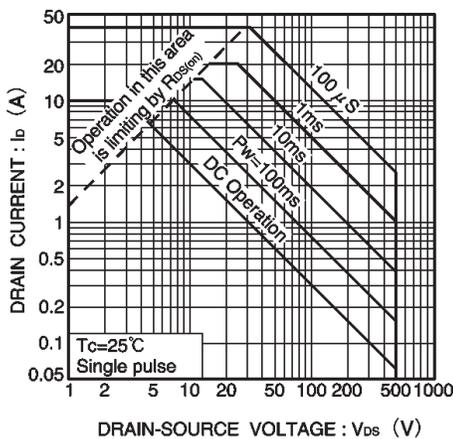
●Electrical characteristic curves

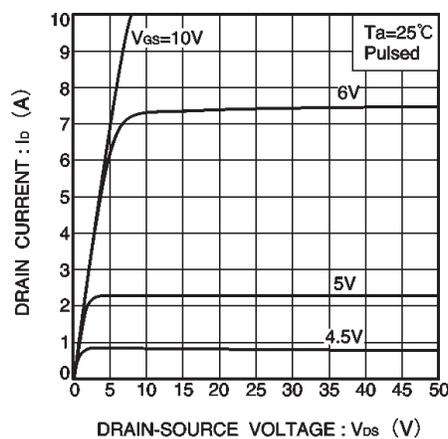Fig.1 Maximum safe operating area

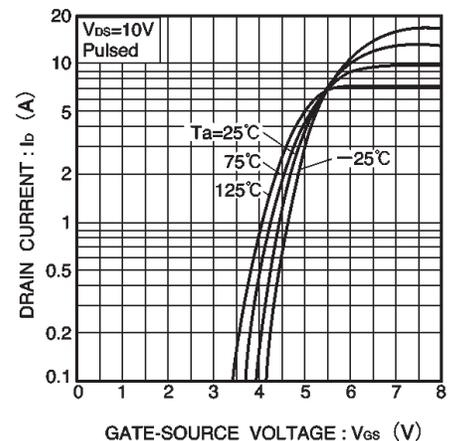Fig.2 Typical output characteristics

Fig.3 Typical transfer characteristics
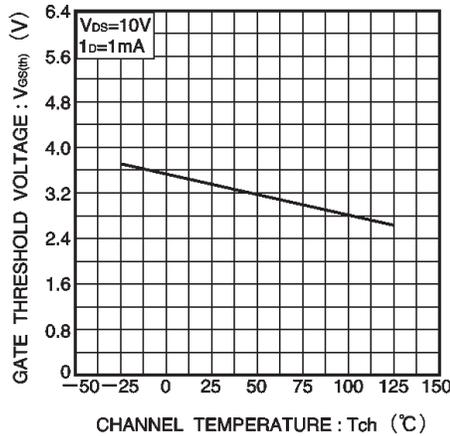
ROHM

139

Fig.4   Gate threshold voltage vs. channel temperature
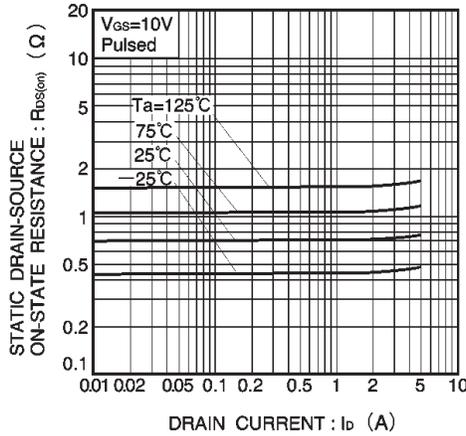

Fig.5   Static drain-source on-state resistance vs. drain current
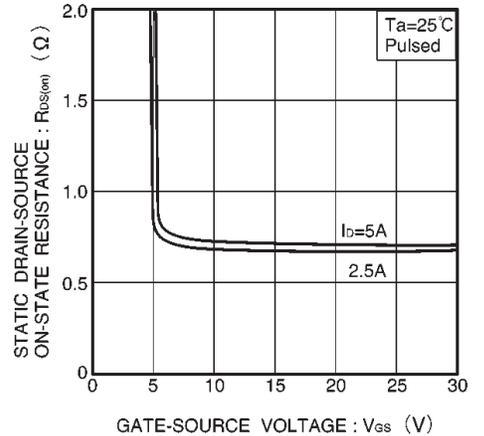

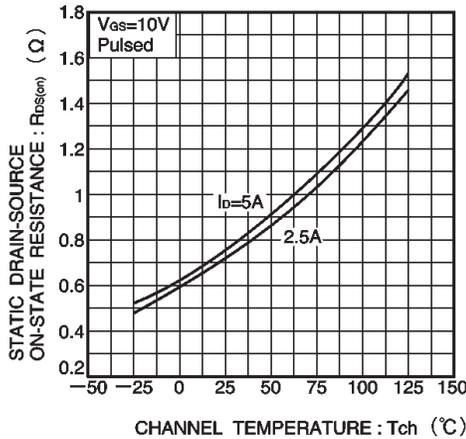Fig.6   Static drain-source on-state resistance vs. gate-source voltage

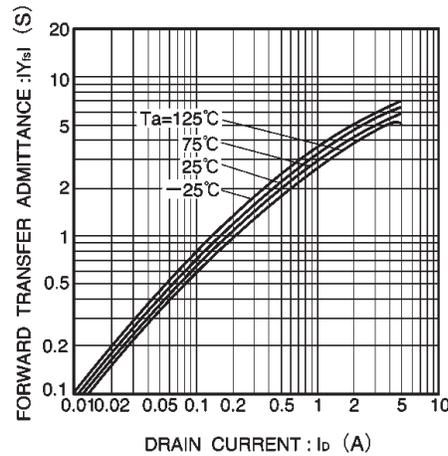Fig.7   Static drain-source on-state resistance vs. channel temperature

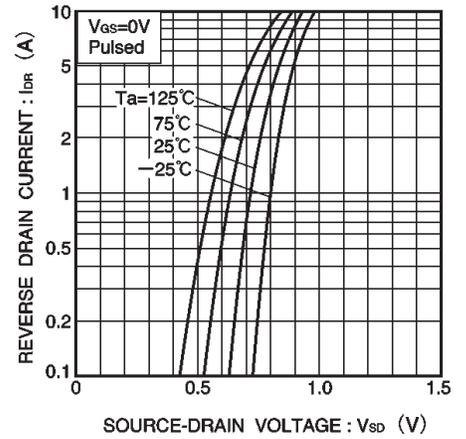

Fig.8   Forward transfer admittance vs. drain current

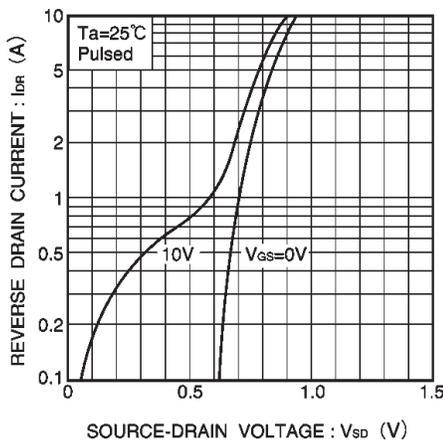Fig.9   Reverse drain current vs. source-drain voltage (Ⅰ)

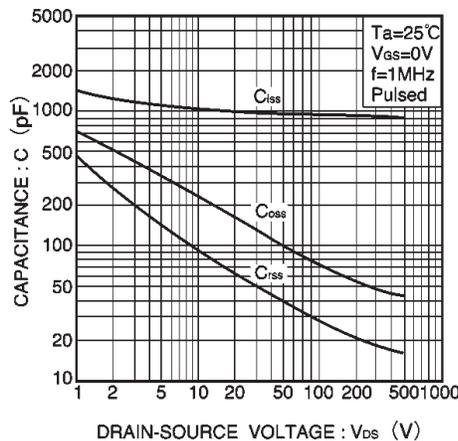Fig.10   Reverse drain current vs. source-drain voltage (Ⅱ)
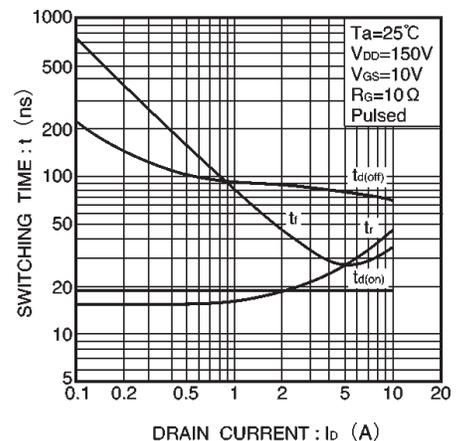

Fig.11   Typical capacitance vs. drain-source voltage

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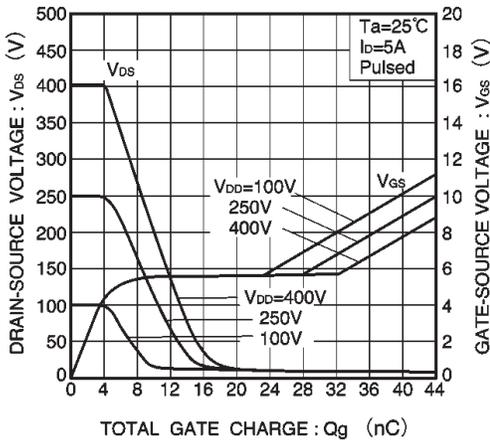
ROHM

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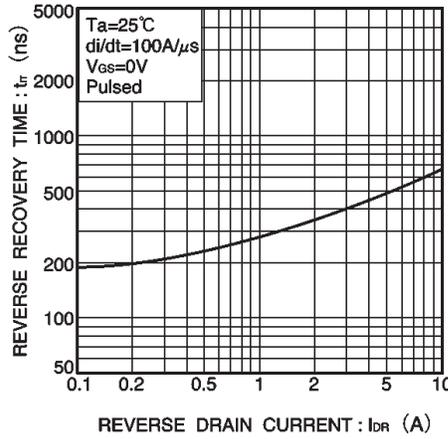

Fig.14 Reverse recovery time
vs. reverse drain current
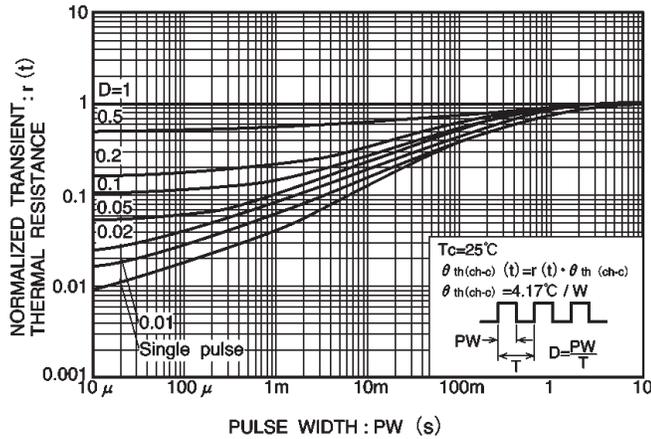

Fig.15 Normalized transient thermal
resistance vs. pulse width
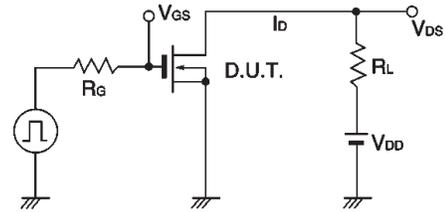
●Switching characteristics
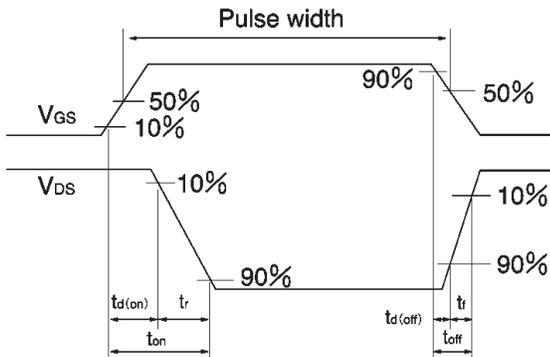measurement circuit

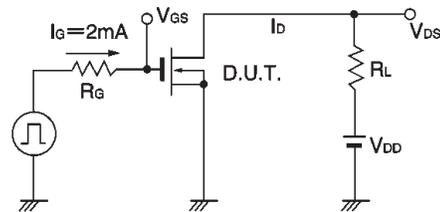Fig.16 Switching time measurement circuit

Fig.17 Switching time waveforms

Fig.18 Gate charge measurement circuit