

# 2SK345, 2SK346

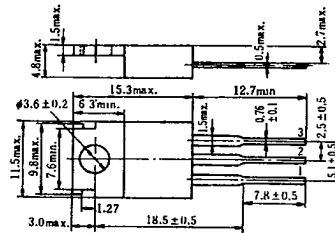
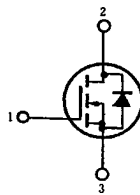
SILICON N-CHANNEL MOS FET

HIGH SPEED POWER SWITCHING,  
LOW FREQUENCY POWER AMPLIFIER

Complementary pair with 2SJ101, 2SJ102

■ FEATURES

- Low On-Resistance.
- High Speed Switching.
- No Secondary Breakdown.
- Good Complementary Characteristics.
- Suitable for Switching Regulator, DC-DC Converter, and PWM Amplifier.



(JEDEC TO-220AB)

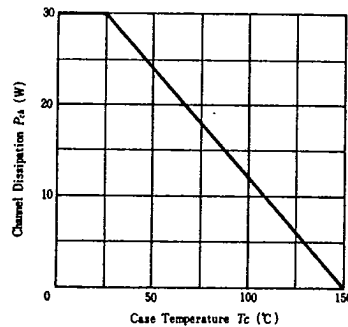
1. Gate  
2. Drain (Flange)  
3. Source  
(Dimensions in mm)

■ ABSOLUTE MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ )

Item	Symbol	Rating		Unit
		2SK345	2SK346	
Drain-Source Voltage	$V_{DS}$	40	60	V
Gate-Source Voltage	$V_{GS}$	±20		V
Drain Current	$I_D$	5		A
Drain Peak Current	$I_{D(pk)}$	10		A
Body-Drain Diode Reverse Drain Current	$I_{DR}$	5		A
Channel Dissipation	$P_{ch}$ *	30		W
Channel Temperature	$T_{ch}$	150		°C
Storage Temperature	$T_{stg}$	-55 ~ +150		°C

\*Value at  $T_c=25^\circ\text{C}$

POWER VS. TEMPERATURE DERATING



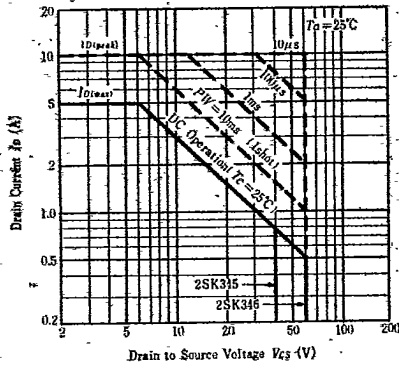
■ ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$ )

Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	2SK345	$I_D=10\text{mA}, V_{GS}=0$	40	—	—	V
	2SK346		60	—	—	V
Gate-Source Leak Current	$I_{GSS}$	$V_{GS}=\pm 20\text{V}, V_{DS}=0$	—	—	±1	μA
Zero Gate Voltage Drain Current	2SK345	$V_{DS}=30\text{V}, V_{GS}=0$	—	—	1	mA
	2SK346		$V_{DS}=50\text{V}, V_{GS}=0$	—	—	1
Gate-Source Cutoff Voltage	$V_{GS(off)}$	$I_D=1\text{mA}, V_{DS}=10\text{V}$	2.0	—	5.0	V
Static Drain-Source On State Resistance	$R_{DS(on)}$	$I_D=3\text{A}, V_{GS}=15\text{V}^*$	—	0.3	0.4	Ω
Drain-Source Saturation Voltage	$V_{DS(on)}$	$I_D=3\text{A}, V_{GS}=15\text{V}^*$	—	0.9	1.2	V
Forward Transfer Admittance	$ y_f $	$I_D=3\text{A}, V_{DS}=10\text{V}^*$	0.5	0.9	—	S
Input Capacitance	$C_{iss}$	$V_{DS}=10\text{V}, V_{GS}=0$ $f=1\text{MHz}$	—	350	—	pF
Output Capacitance	$C_{oss}$		—	290	—	pF
Reverse Transfer Capacitance	$C_{rss}$		—	80	—	pF
Turn-on Delay Time	$t_{R(on)}$	$I_D=2\text{A}, V_{GS}=15\text{V}$ $R_L=15\Omega$	—	12	—	ns
Rise Time	$t_r$		—	28	—	ns
Turn-off Delay Time	$t_{R(off)}$		—	30	—	ns
Fall Time	$t_f$		—	40	—	ns
Body-Drain Diode Forward Voltage	$V_{DF}$		$I_D=3\text{A}, V_{GS}=0$	—	0.85	—
Body-Drain Diode Reverse Recovery Time	$t_r$	$I_D=3\text{A}, V_{GS}=0$ $di_f/dt=500\text{A}/\mu\text{s}$	—	160	—	ns

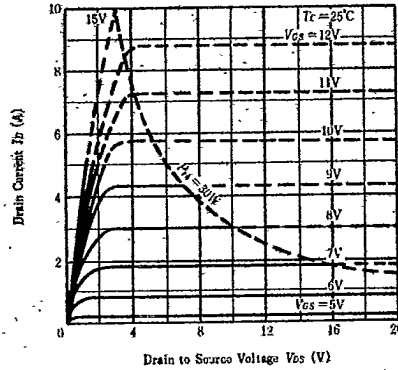
\*Pulse Test

2SK345, 2SK346

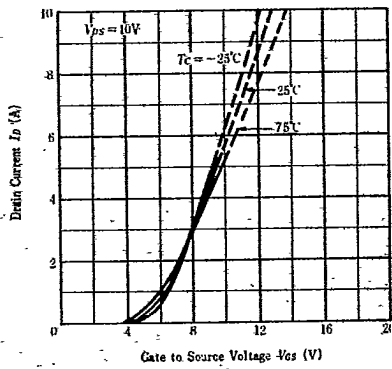
MAXIMUM SAFE OPERATION AREA



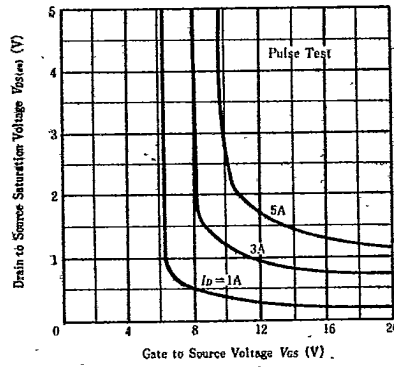
TYPICAL OUTPUT CHARACTERISTICS



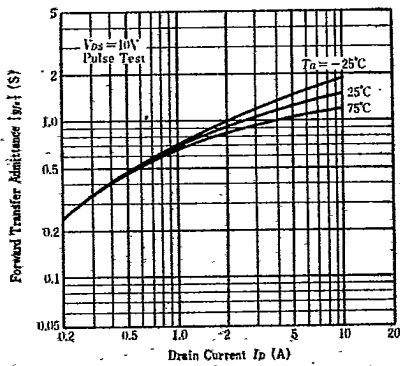
TYPICAL TRANSFER CHARACTERISTICS



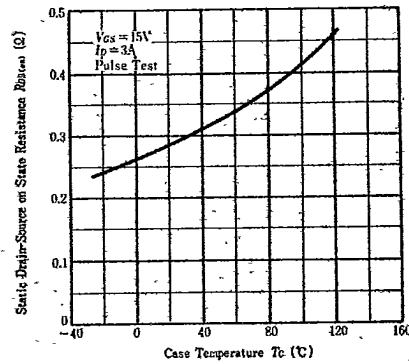
DRAIN-SOURCE SATURATION VOLTAGE VS. GATE-SOURCE VOLTAGE



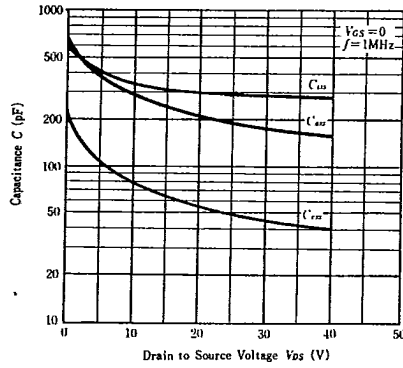
FORWARD TRANSFER ADMITTANCE VS. DRAIN CURRENT



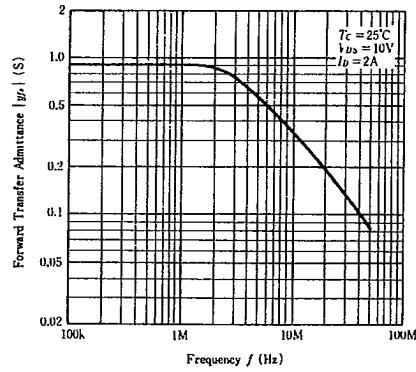
STATIC DRAIN-SOURCE ON STATE RESISTANCE VS. TEMPERATURE



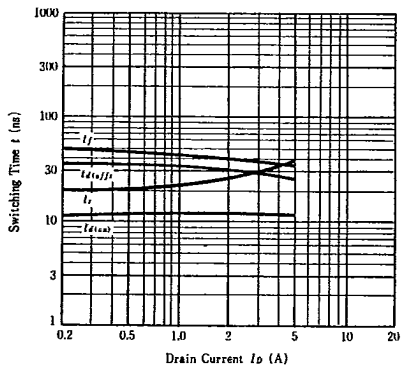
**TYPICAL CAPACITANCE VS. DRAIN-SOURCE VOLTAGE**



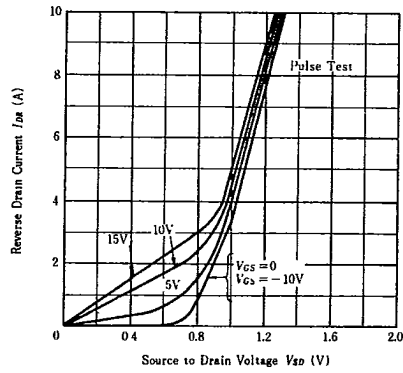
**FORWARD TRANSFER ADMITTANCE VS. FREQUENCY**



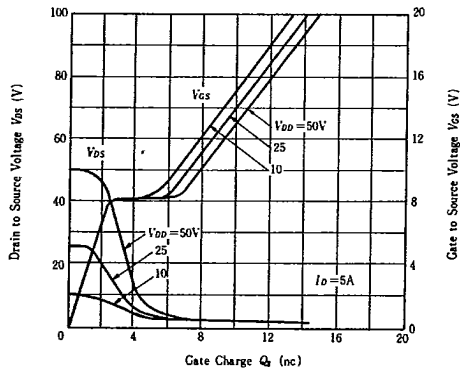
**SWITCHING CHARACTERISTICS**



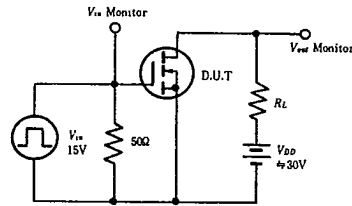
**MAXIMUM BODY-DRAIN DIODE FORWARD VOLTAGE**



**DYNAMIC INPUT CHARACTERISTICS**



**SWITCHING TIME TEST CIRCUIT**



**WAVEFORMS**

