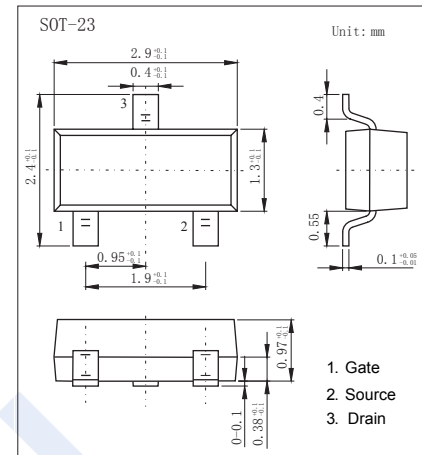
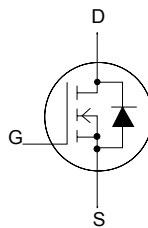


## N-Channel MOSFET

### BSH105 (KSH105)

#### ■ Features

- $V_{DS} (V) = 20V$
- $I_D = 1.05 A (V_{GS} = 10V)$
- $R_{DS(ON)} < 200m\Omega (V_{GS} = 4.5V)$
- $R_{DS(ON)} < 250m\Omega (V_{GS} = 2.5V)$
- $R_{DS(ON)} < 300m\Omega (V_{GS} = 1.8V)$



#### ■ Absolute Maximum Ratings $T_a = 25^\circ C$

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DS}$	20	V	
Drain-Gate voltage ( $R_{GS} = 20 K\Omega$ )	$V_{DGR}$	20		
Gate-Source Voltage	$V_{GS}$	$\pm 8$		
Continuous Drain Current	$I_D$	$T_a=25^\circ C$	1.05	A
		$T_a=100^\circ C$	0.67	
Pulsed Drain Current	$I_{DM}$	4.2		
Power Dissipation	$P_D$	$T_a=25^\circ C$	417	mW
		$T_a=100^\circ C$	170	
Thermal Resistance.Junction- to-Ambient	$R_{thJA}$	300	$^\circ C/W$	
Junction Temperature	$T_J$	150	$^\circ C$	
Storage Temperature Range	$T_{stg}$	-55 to 150		

## N-Channel MOSFET

## BSH105 (KSH105)

## ■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	I <sub>D</sub> =250 μA, V <sub>GS</sub> =0V	20			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =16V, V <sub>GS</sub> =0V			0.1	μA
		V <sub>DS</sub> =16V, V <sub>GS</sub> =0V, T <sub>J</sub> =150°C			10	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±8V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =1mA	0.4		1.2	V
		V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =1mA, T <sub>J</sub> =150°C	0.1			
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.6A			200	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.6A			250	
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.6A, T <sub>J</sub> =150°C			375	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =0.3A			300	
Forward transconductance	g <sub>fs</sub>	V <sub>DS</sub> = 16 V; I <sub>D</sub> = 0.6 A		1.6		S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =16V, f=1MHz		152		pF
Output Capacitance	C <sub>oss</sub>			71		
Reverse Transfer Capacitance	C <sub>rss</sub>			33		
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =20V, I <sub>D</sub> =1A		3.9		nC
Gate Source Charge	Q <sub>gs</sub>			0.4		
Gate Drain Charge	Q <sub>gd</sub>			1.4		
Turn-On DelayTime	t <sub>d(on)</sub>	V <sub>GS</sub> =8V, V <sub>DS</sub> =20V, I <sub>D</sub> =1A, R <sub>G</sub> =6Ω		2		ns
Turn-On Rise Time	t <sub>r</sub>			4.5		
Turn-Off DelayTime	t <sub>d(off)</sub>			45		
Turn-Off Fall Time	t <sub>f</sub>			20		
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 0.5A, di/dt= 100A/μs, V <sub>GS</sub> = 0 V; V <sub>R</sub> = 16 V		27		nA
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			19		
Maximum Body-Diode Continuous Current	I <sub>S</sub>				1.05	A
Pulsed Reverse Drain Current	I <sub>SM</sub>				4.2	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =0.5A, V <sub>GS</sub> =0V			1	V

## N-Channel MOSFET BSH105 (KSH105)

■ Typical Characteristics

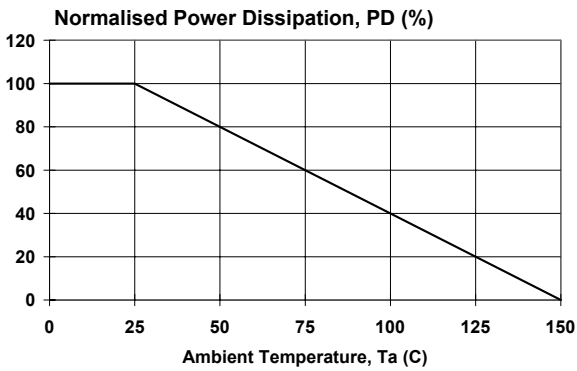


Fig.1. Normalised power dissipation.  
 $PD\% = 100 \cdot P_D / P_{D 25^\circ C} = f(T_a)$

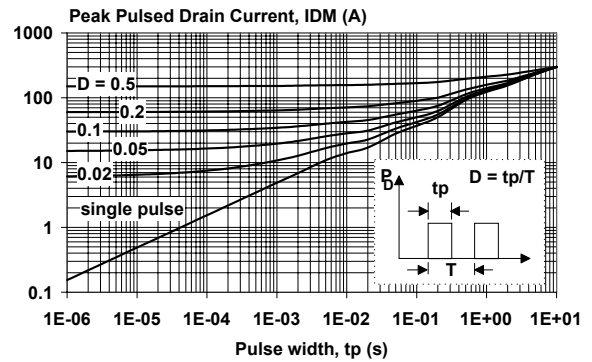


Fig.4. Transient thermal impedance.  
 $Z_{th-j-a} = f(t)$ ; parameter  $D = t_p / T$

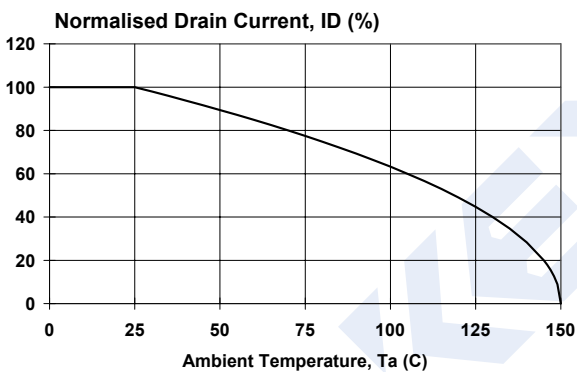


Fig.2. Normalised continuous drain current.  
 $ID\% = 100 \cdot I_D / I_{D 25^\circ C} = f(T_a)$ ; conditions:  $V_{GS} \geq 4.5 V$

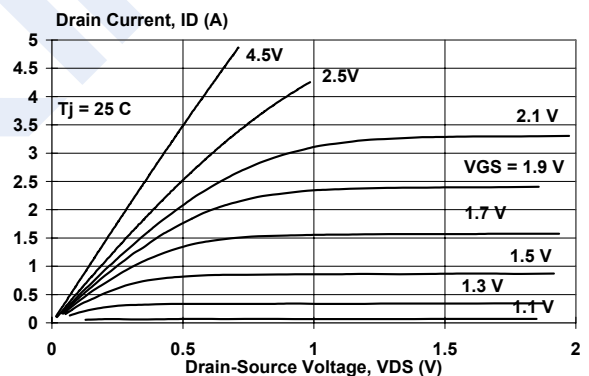


Fig.5. Typical output characteristics,  $T_j = 25^\circ C$ .  
 $I_D = f(V_{DS})$ ; parameter  $V_{GS}$

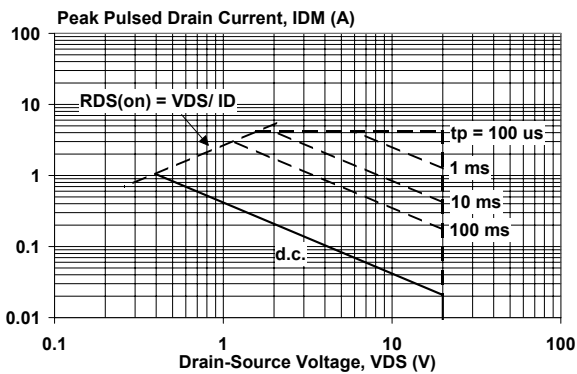


Fig.3. Safe operating area.  $T_a = 25^\circ C$   
 $I_D$  &  $I_{DM} = f(V_{DS})$ ;  $I_{DM}$  single pulse; parameter  $t_p$

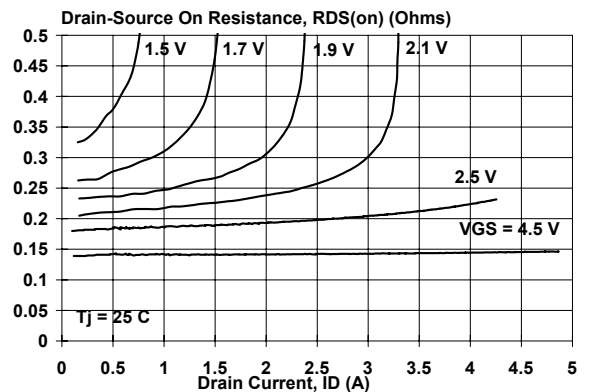


Fig.6. Typical on-state resistance,  $T_j = 25^\circ C$ .  
 $R_{DS(ON)} = f(I_D)$ ; parameter  $V_{GS}$

## N-Channel MOSFET BSH105 (KSH105)

### Typical Characteristics

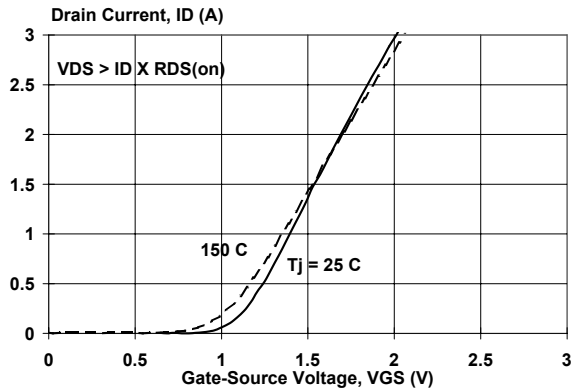


Fig. 7. Typical transfer characteristics.  
 $I_D = f(V_{GS})$

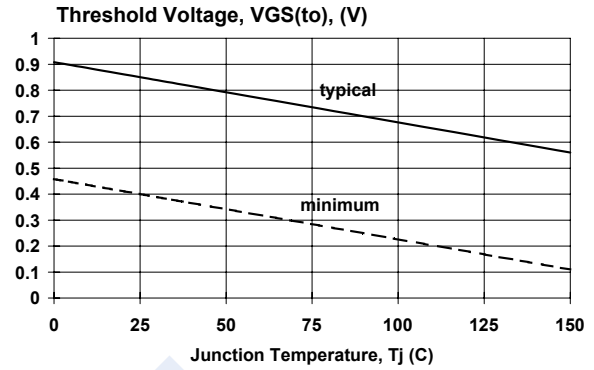


Fig. 10. Gate threshold voltage.  
 $V_{GS(TO)} = f(T_j)$ ; conditions:  $I_D = 1 \text{ mA}$ ;  $V_{DS} = V_{GS}$

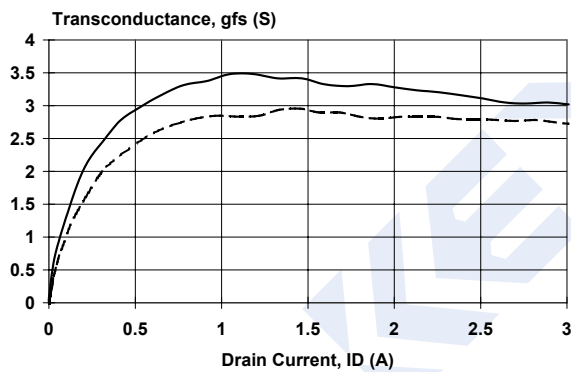


Fig. 8. Typical transconductance,  $T_j = 25 \text{ }^\circ\text{C}$ .  
 $g_{fs} = f(I_D)$

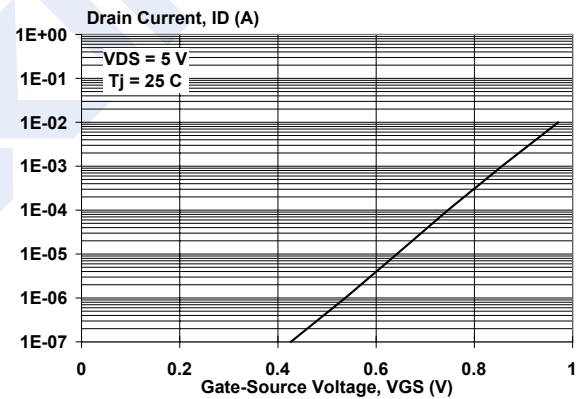


Fig. 11. Sub-threshold drain current.  
 $I_D = f(V_{GS})$ ; conditions:  $T_j = 25 \text{ }^\circ\text{C}$

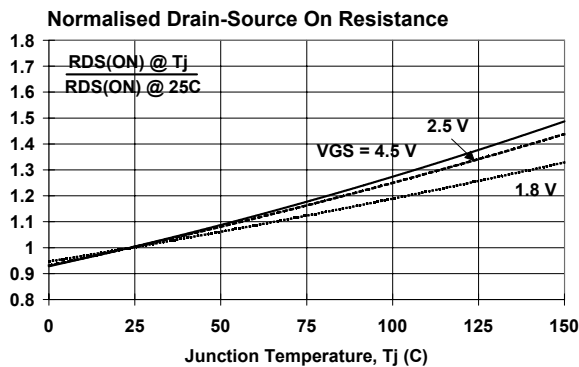


Fig. 9. Normalised drain-source on-state resistance.  
 $R_{DS(ON)}/R_{DS(ON)25^\circ\text{C}} = f(T_j)$

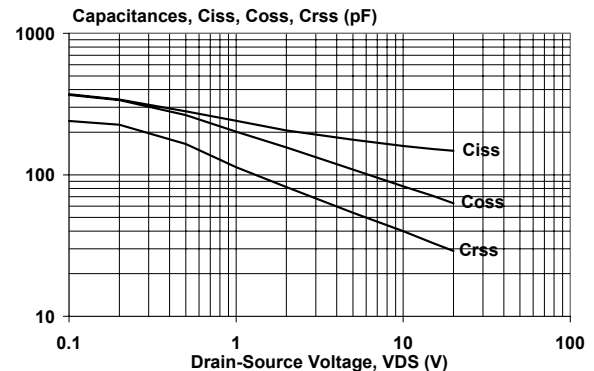


Fig. 12. Typical capacitances,  $C_{iss}$ ,  $C_{oss}$ ,  $C_{rss}$ .  
 $C = f(V_{DS})$ ; conditions:  $V_{GS} = 0 \text{ V}$ ;  $f = 1 \text{ MHz}$

## N-Channel MOSFET BSH105 (KSH105)

### ■ Typical Characteristics

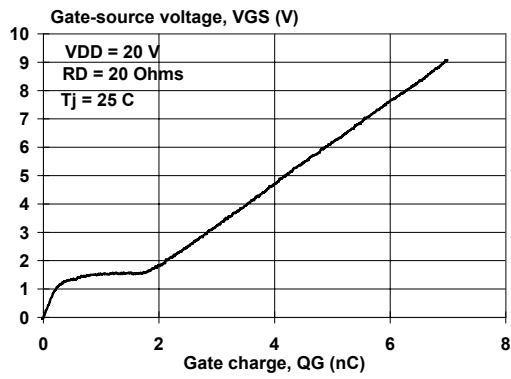


Fig. 13. Typical turn-on gate-charge characteristics.  
 $V_{GS} = f(Q_G)$

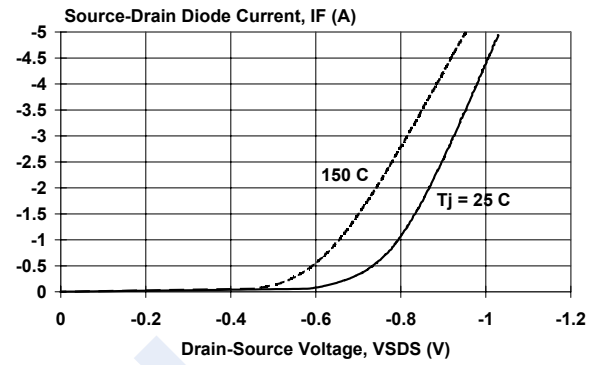


Fig. 14. Typical reverse diode current.  
 $I_F = f(V_{SDS})$ ; conditions:  $V_{GS} = 0$  V; parameter  $T_j$