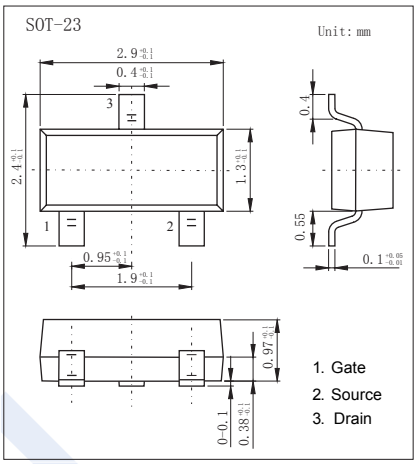
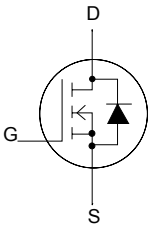
N-Channel MOSFET

BSH105 (KSH105)



■ Features

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



■ Absolute Maximum Ratings Ta = 25℃

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

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=250μA, V_{GS}=0V	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=16V, V_{GS}=0V			0.1	uA
		V_{DS}=16V, V_{GS}=0V, T_J=150℃			10	
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±8V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} , I_D=1mA	0.4		1.2	V
		V_{DS}=V_{GS} , I_D=1mA , T_J=150℃	0.1			
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=4.5V, I_D=0.6A			200	mΩ
		V_{GS}=2.5V, I_D=0.6A			250	
		V_{GS}=2.5V, I_D=0.6A T_J=150℃			375	
		V_{GS}=1.8V, I_D=0.3A			300	
Forward transconductance	gfs	V_{DS} = 16 V; I_D = 0.6 A		1.6		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=16V, f=1MHz		152		pF
Output Capacitance	C_{oss}			71		
Reverse Transfer Capacitance	C_{rss}			33		
Total Gate Charge	Q_g	V_{GS}=4.5V, V_{DS}=20V, I_D=1A		3.9		nC
Gate Source Charge	Q_{gs}			0.4		
Gate Drain Charge	Q_{gd}			1.4		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=8V, V_{DS}=20V, I_D=1A,R_G=6Ω		2		ns
Turn-On Rise Time	t_r			4.5		
Turn-Off DelayTime	$t_{d(off)}$			45		
Turn-Off Fall Time	t_f			20		
Body Diode Reverse Recovery Time	t_{rr}	I_F= 0.5A, dI/dt= 100A/μs, V_{GS} = 0 V; V_R = 16 V		27		
Body Diode Reverse Recovery Charge	Q_{rr}			19		nC
Maximum Body-Diode Continuous Current	I_S				1.05	A
Pulsed Reverse Drain Current	I_{SM}				4.2	
Diode Forward Voltage	V_{SD}	I_S=0.5A,V_{GS}=0V			1	V

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■ Typical Characterisitics

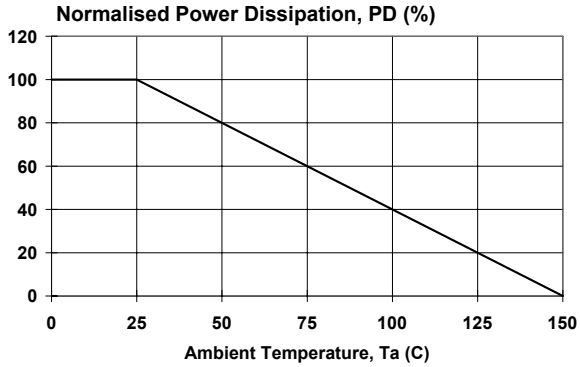

Fig.1. Normalised power dissipation.
PD% = 100·P_D/$P_{D\ 25\ ^\circ C}$ = f(T_a)

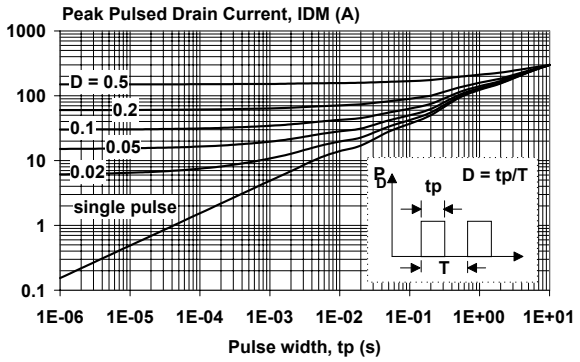

Fig.4. Transient thermal impedance.
$Z_{th\ j\text{-}a}$ = f(t); parameter D = t_p/T

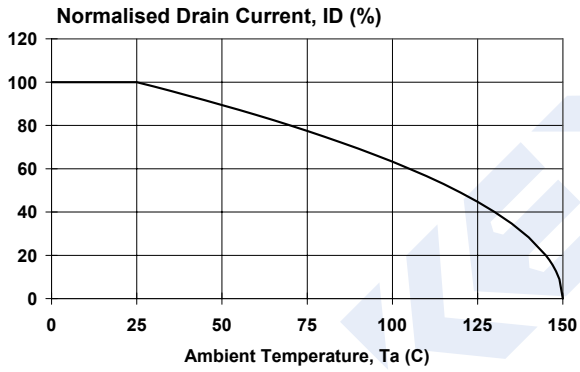

Fig.2. Normalised continuous drain current.
ID% = 100·I_D/$I_{D\ 25\ ^\circ C}$ = f(T_a); conditions: $V_{GS} \geq 4.5$ V

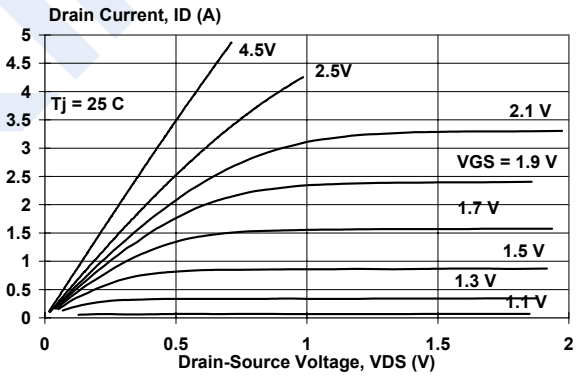

Fig.5. Typical output characteristics, T_j = 25 ˚C.
I_D = f(V_{DS}); parameter V_{GS}

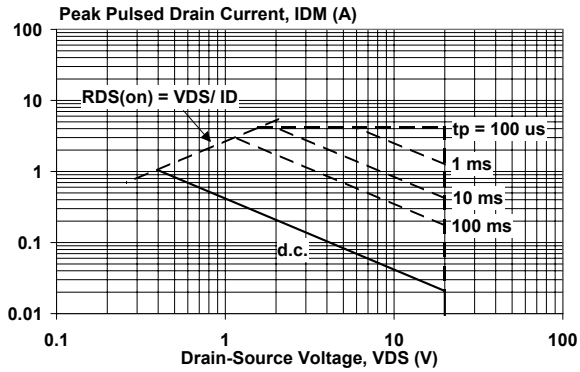

Fig.3. Safe operating area. T_a = 25 ˚C
I_D & I_{DM} = f(V_{DS}); I_{DM} single pulse; parameter t_p

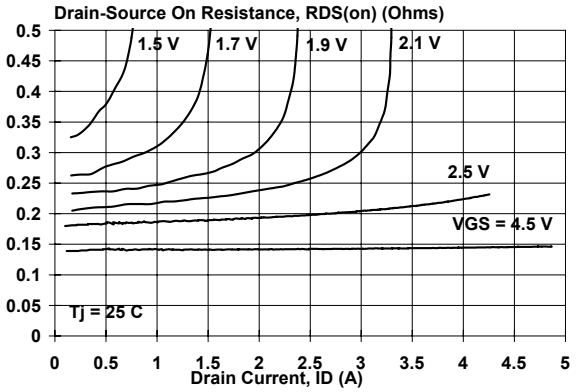

Fig.6. Typical on-state resistance, T_j = 25 ˚C.
$R_{DS(ON)}$ = f(I_D); parameter V_{GS}

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■ Typical Characterisitics

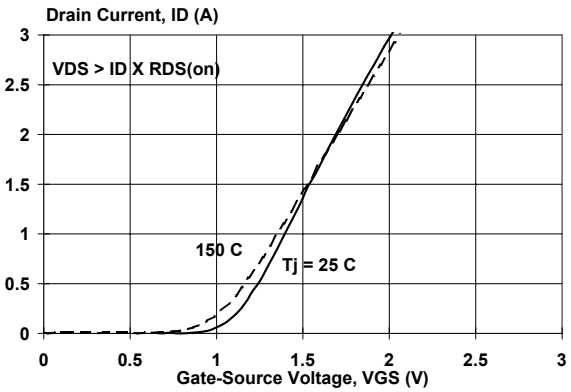

Fig.7. Typical transfer characteristics.
$I_D = f(V_{GS})$

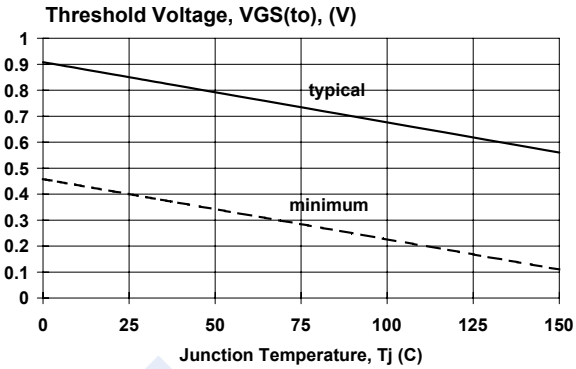

Fig.10. Gate threshold voltage.
$V_{GS(TO)} = f(T_j)$; conditions: I_D = 1 mA; $V_{DS} = V_{GS}$

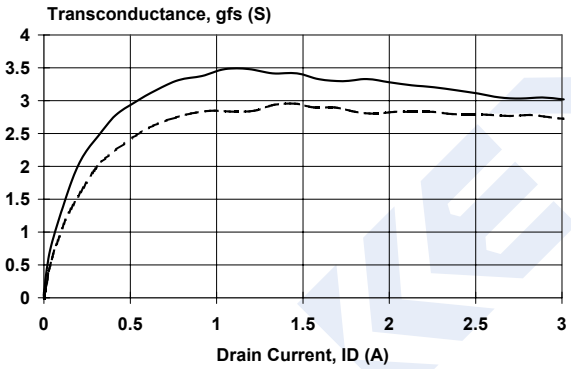

Fig.8. Typical transconductance, T_j = 25 ˚C.
$g_{fs} = f(I_D)$

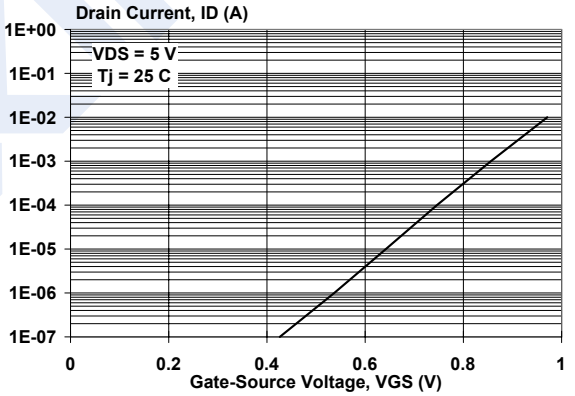

Fig.11. Sub-threshold drain current.
$I_D = f(V_{GS})$; conditions: T_j = 25 ˚C

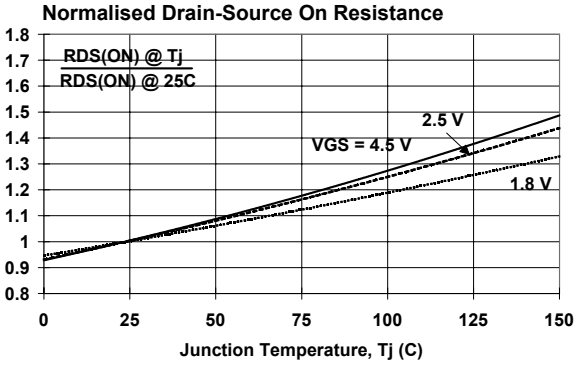

Fig.9. Normalised drain-source on-state resistance.
$R_{DS(ON)}/R_{DS(ON)25\ ^{\circ}C} = f(T_j)$

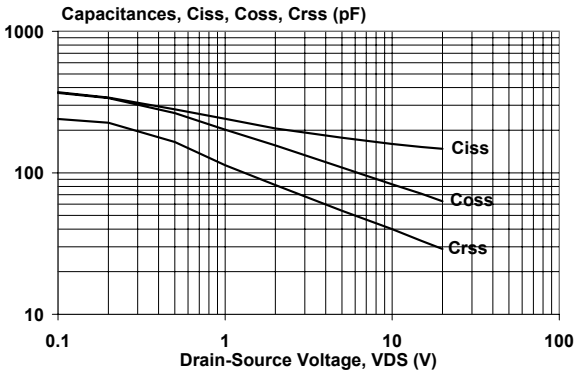

Fig.12. Typical capacitances, C_{iss}, C_{oss}, C_{rss}.
$C = f(V_{DS})$; conditions: V_{GS} = 0 V; f = 1 MHz

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■ Typical Characterisitics

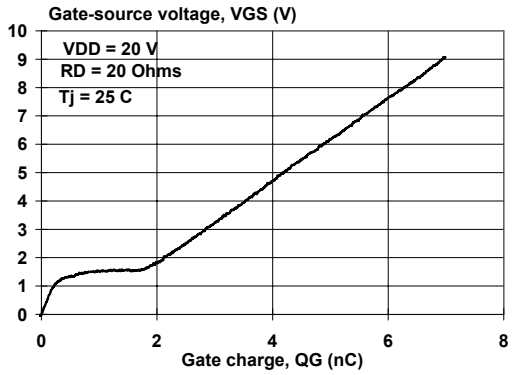

Fig.13. Typical turn-on gate-charge characteristics. $V_{GS} = f(Q_G)$

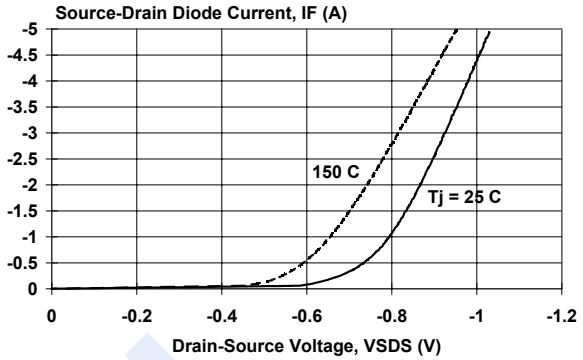

Fig.14. Typical reverse diode current. $I_F = f(V_{SDS})$; conditions: $V_{GS} = 0$ V; parameter T_j