SamHop Microelectronics Corp.

SDP/B55N03L

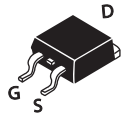
September , 2002

N-Channel Logic Level Enhancement Mode Field Effect Transistor

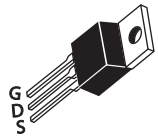
PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(on)}$ (mΩ) TYP
30V	55A	12.5 @ V_{GS} = 10V
		20 @ V_{GS} = 4.5V

FEATURES

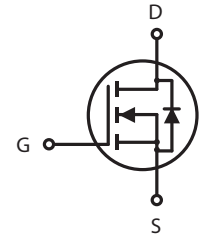
- Super high dense cell design for extremely low RDS(ON).
- High power and current handling capability.
- TO-220 & TO-263 package.



SDB SERIES
TO-263(DD-PAK)



SDP SERIES
TO-220



ABSOLUTE MAXIMUM RATINGS (TC=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous @TJ=125°C	I_D	55	A
-Pulsed [a]	I_{DM}	140	A
Drain-Source Diode Forward Current	I_S	55	A
Maximum Power Dissipation @Tc=25°C	P_D	75	W
Derate above 25°C		0.5	W/°C
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to 175	°C
THERMAL CHARACTERISTICS			
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.5	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	°C/W

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ELECTRICAL CHARACTERISTICS (T_C=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V, V_{GS}=0V			10	uA
Gate-Body Leakage	I_{GSS}	V_{GS}= ±16V, V_{DS}=0V			±100	nA
ON CHARACTERISTICS [a]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1	1.5	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D= 27A		12.5	14	m ohm
		V_{GS} = 4.5V, I_D= 22A		20	23	m ohm
On-State Drain Current	$I_{D(ON)}$	V_{GS}=10V, V_{DS}=10V	60			A
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=27A		32		S
DYNAMIC CHARACTERISTICS [b]						
Input Capacitance	C_{ISS}	V_{DS}=15V, V_{GS}=0V f=1.0MHz		930		pF
Output Capacitance	C_{OSS}			340		pF
Reverse Transfer Capacitance	C_{RSS}			120		pF
SWITCHING CHARACTERISTICS [b]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=15V, I_D=1A, V_{GS}=10V, R_{GEN}=60 ohm		17	16	ns
Rise Time	t_r			23	250	ns
Turn-Off Delay Time	$t_{D(OFF)}$			37	90	ns
Fall Time	t_f			20	200	ns
Total Gate Charge	Q_g	V_{DS}=15V, I_D=27.5A, V_{GS}=10V		26.1	35	nC
		V_{DS}=15V, I_D=27.5A, V_{GS}=4.5V		13.7	16.5	nC
Gate-Source Charge	Q_{gs}	V_{DS}=15V, I_D=27.5A, V_{GS}=10V		5.4		nC
Gate-Drain Charge	Q_{gd}			4.6		nC

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ELECTRICAL CHARACTERISTICS (T_C=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS [a]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, Is =26A		0.9	1.3	V

Notes

a.Pulse Test:Pulse Width ≤ 300us, Duty Cycle ≤ 2%.

b.Guaranteed by design, not subject to production testing.

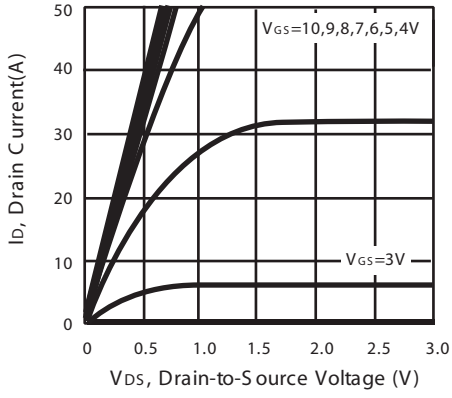

Figure 1. Output Characteristics

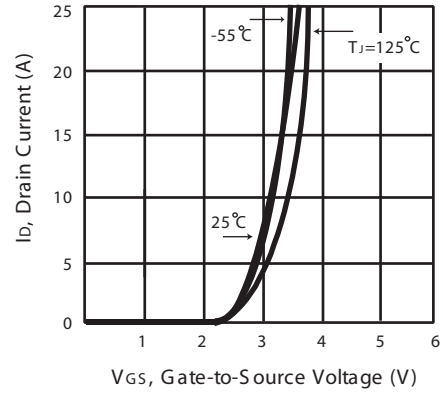

Figure 2. Transfer Characteristics

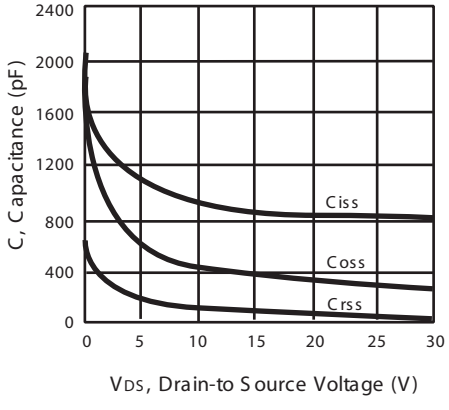

Figure 3. Capacitance

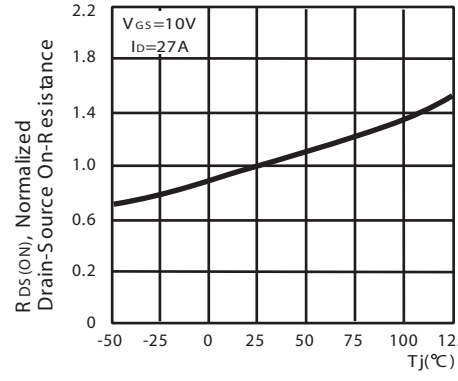

Figure 4. On-Resistance Variation with Temperature

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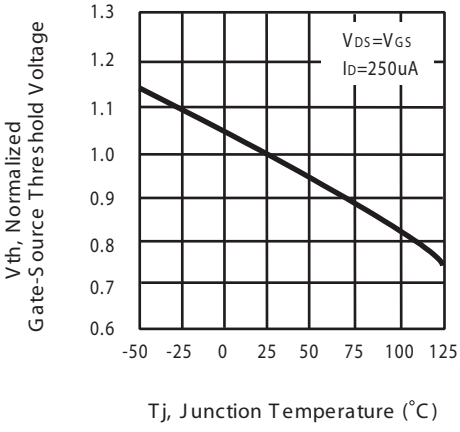

Figure 5. Gate Threshold Variation with Temperature

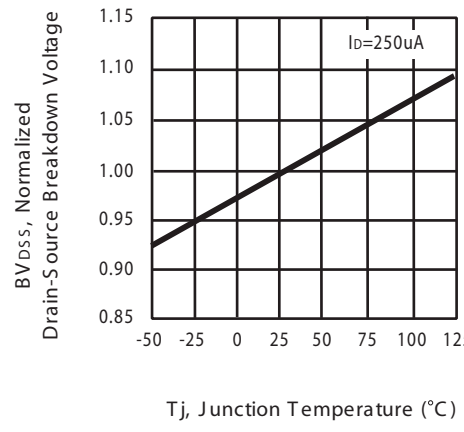

Figure 6. Breakdown Voltage Variation with Temperature

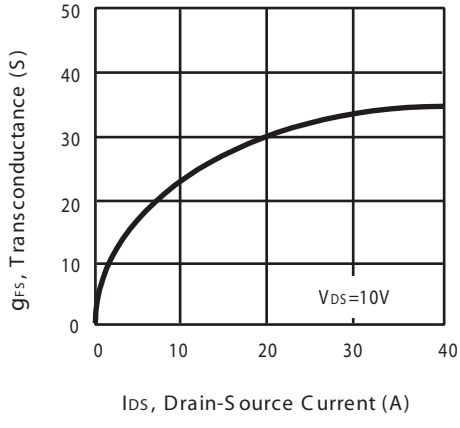

Figure 7. Transconductance Variation with Drain Current

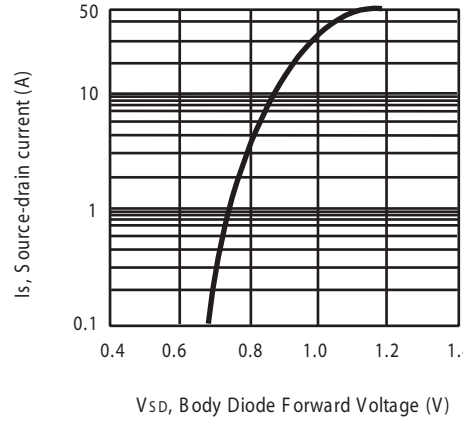

Figure 8. Body Diode Forward Voltage Variation with Source Current

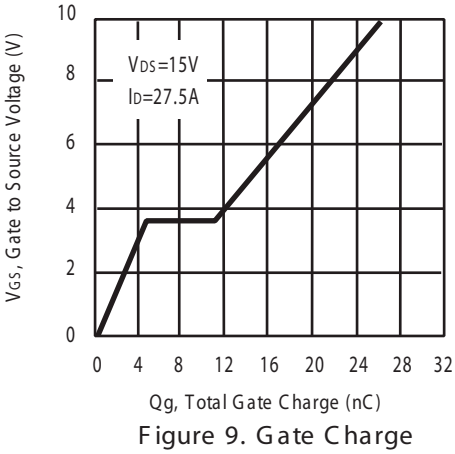

Figure 9. Gate Charge

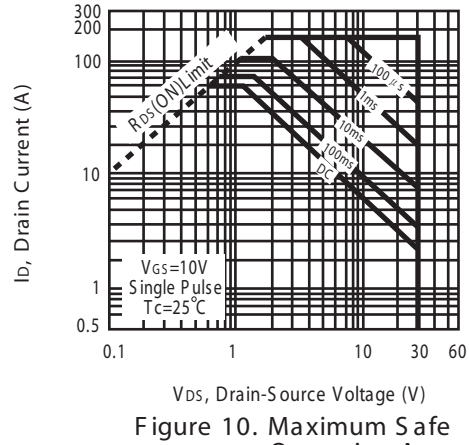

Figure 10. Maximum Safe Operating Area

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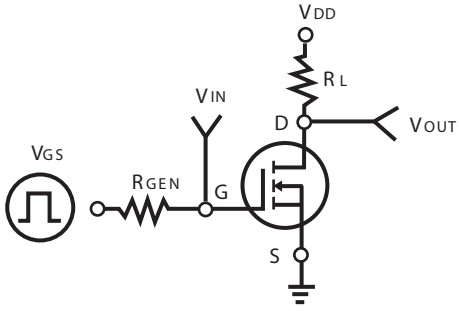

Figure 11. Switching Test Circuit

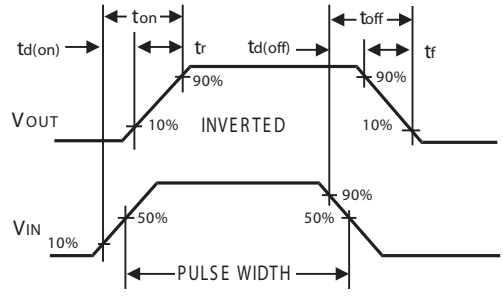

Figure 12. Switching Waveforms

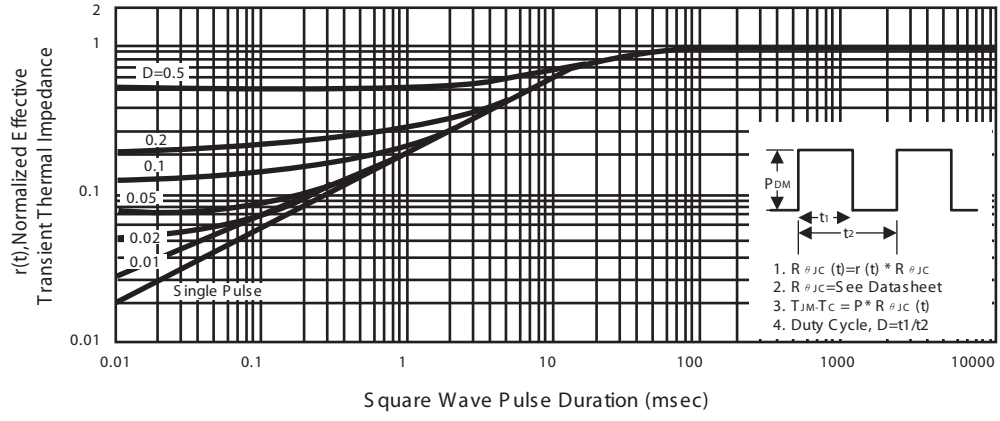

Figure 13. Normalized Thermal Transient Impedance Curve