N-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (mΩ) TYP
30V	65A	8 @ V_{GS} = 10V
		12 @ 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 @ T_J=125°C	I_D	65	A
-Pulsed [a]	I_{DM}	195	A
Drain-Source Diode Forward Current	I_S	65	A
Maximum Power Dissipation @ T_C=25°C	P_D	75	W
Derate above 25°C		0.5	W/$^\circ$C
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to 175	$^\circ$C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2	$^\circ$C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	$^\circ$C/W

ELECTRICAL CHARACTERISTICS (T$_C$=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ[C]	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$_{GS}$=±20V, 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$_D$=26A		8	9	m ohm
		V$_{GS}$=4.5V, I$_D$=21A		12	15	m ohm
On-State Drain Current	I$_{D(ON)}$	V$_{DS}$=10V, V$_{GS}$=10V	65			A
Forward Transconductance	g$_{FS}$	V$_{DS}$=10V, I$_D$=26A		38		S
DYNAMIC CHARACTERISTICS [b]						
Input Capacitance	C$_{ISS}$	V$_{DS}$=15V, V$_{GS}$=0V f=1.0MHz		1350		pF
Output Capacitance	C$_{OSS}$			625		pF
Reverse Transfer Capacitance	C$_{RSS}$			190		pF
SWITCHING CHARACTERISTICS [b]						
Turn-On Delay Time	t$_{D(ON)}$	V$_{DD}$=15V, I$_D$=1A, V$_{GS}$=10V R$_{GEN}$=6 ohm		30		ns
Rise Time	t$_r$			32		ns
Turn-Off Delay Time	t$_{D(OFF)}$			132		ns
Fall Time	t$_f$			30		ns
Total Gate Charge	Q$_g$	V$_{DS}$=10V, I$_D$=65A, V$_{GS}$=10V		41	50	nC
		V$_{DS}$=10V, I$_D$=65A, V$_{GS}$=4.5V		20.5	24.5	nC
Gate-Source Charge	Q$_{gs}$	V$_{DS}$=10V, I$_D$=65A, V$_{GS}$=10V		6.9		nC
Gate-Drain Charge	Q$_{gd}$			5.8		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$\le$ 300us, Duty Cycle$\le$ 2%.
b.Guaranteed by design, not subject to production testing.
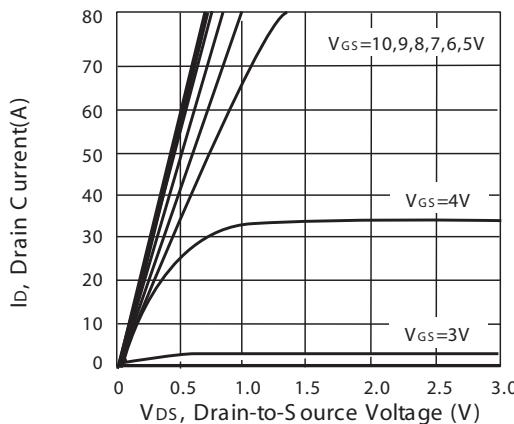

Figure 1. Output Characteristics
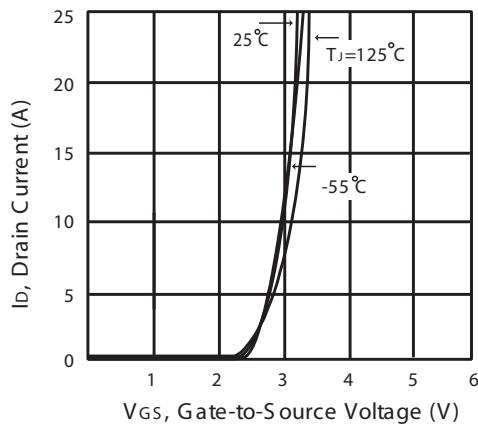
Figure 2. Transfer Characteristics
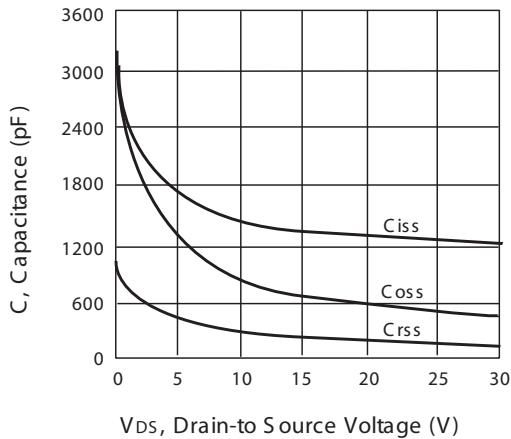
Figure 3. Capacitance
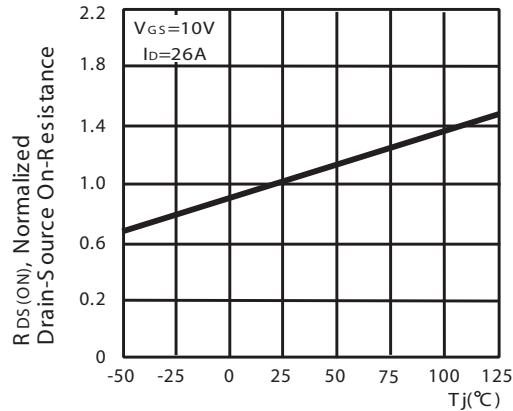
Figure 4. On-Resistance Variation with Temperature

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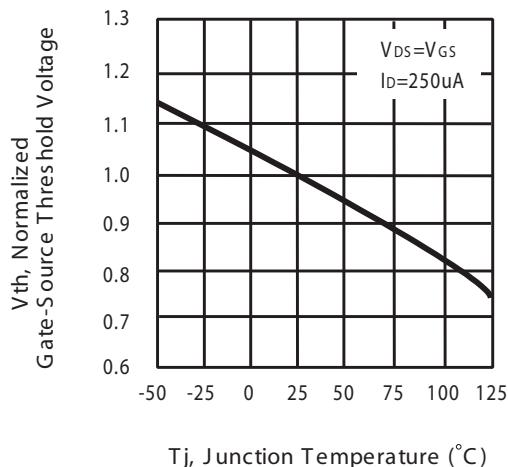
Figure 5. Gate Threshold Variation with Temperature
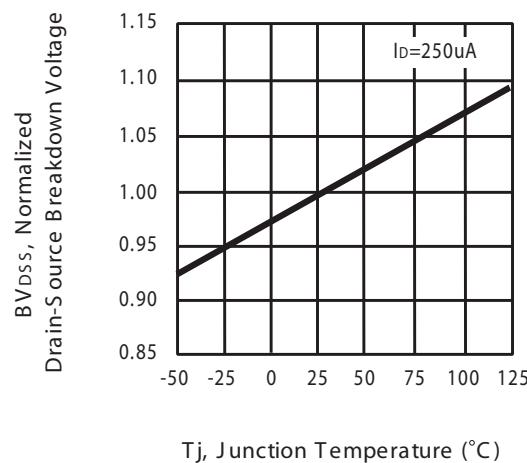
Figure 6. Breakdown Voltage Variation with Temperature
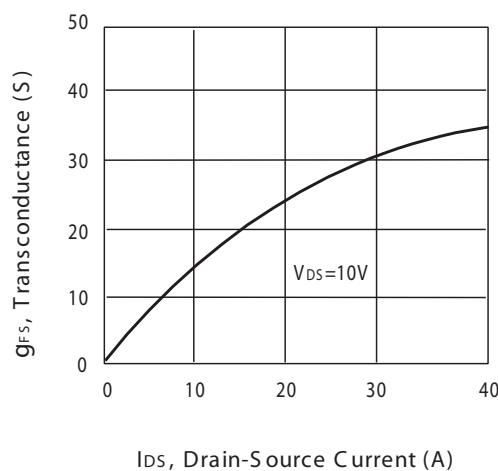
Figure 7. Transconductance Variation with Drain Current
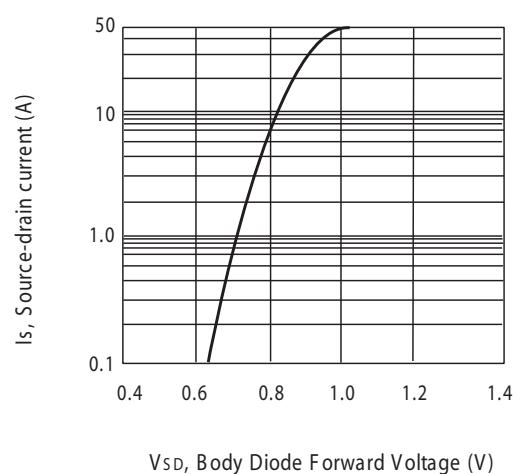
Figure 8. Body Diode Forward Voltage Variation with Source Current
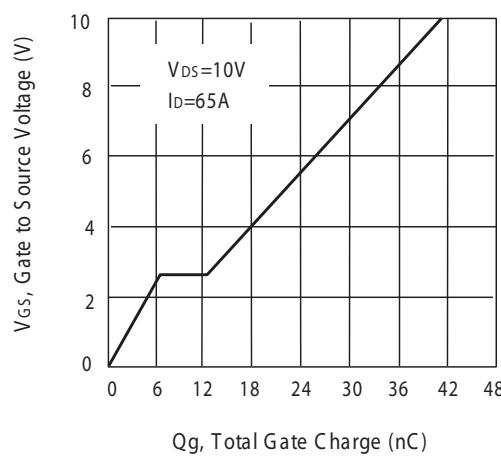
Figure 9. Gate Charge
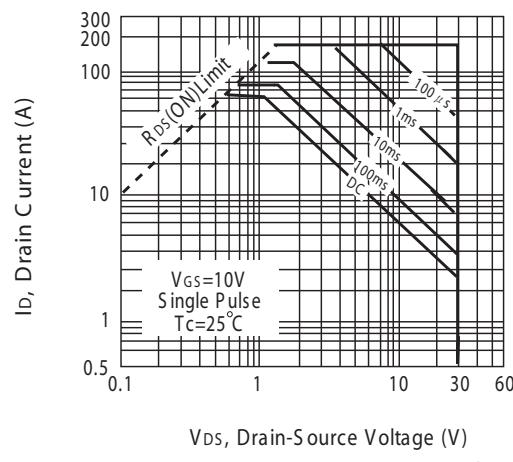
Figure 10. Maximum Safe Operating Area

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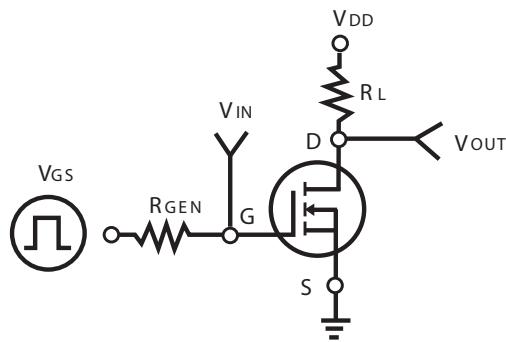
Figure 11. Switching Test Circuit
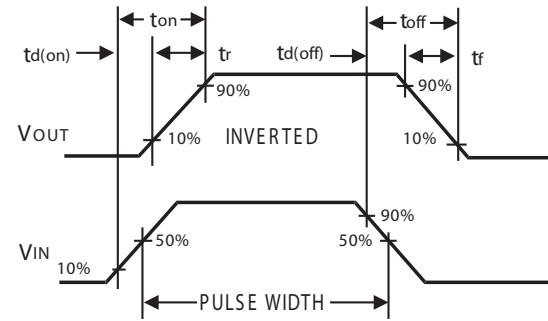
Figure 12. Switching Waveforms
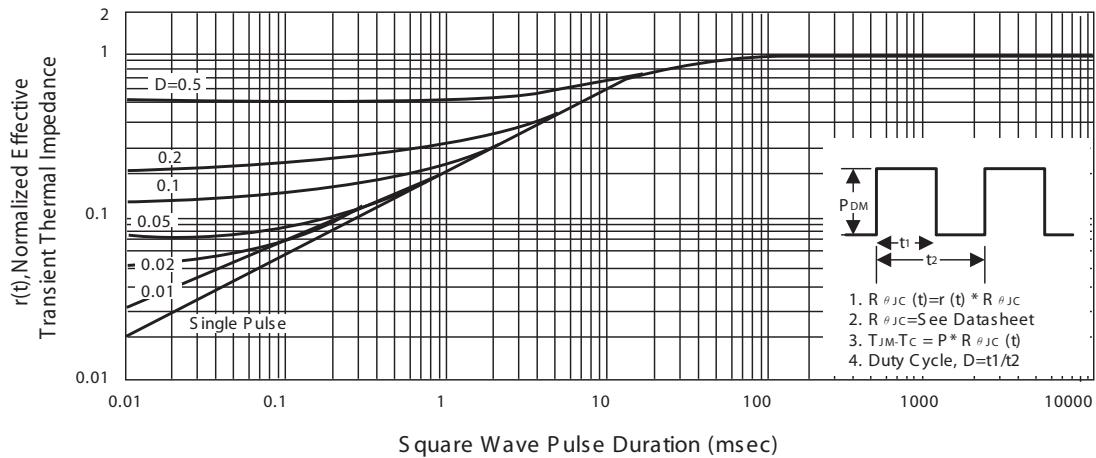
Figure 13. Normalized Thermal Transient Impedance Curve

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