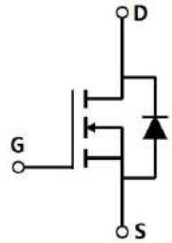
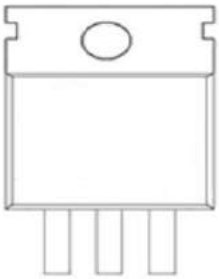
80V N-Channel Enhancement Mode MOSFET

General Description

70N08 use advanced Trench MOSFET t echnology to provide low RDS(ON), low gate charge, fast switching

This device is specially designed to get better ruggedness and suitable to use in





Features

Low RDS(on) & FOM

Extremely low switching loss

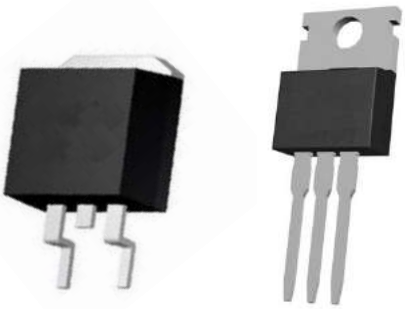
Excellent stability and uniformity or Invertors

Applications

Consumer electronic power supply Motor control

Synchronous-rectification Isolated DC

Synchronous-rectification applications



Absolute Maximum Ratings at T_j=25℃ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage (V_{GS}=0V）	V_{DS}	80	V
Gate-Source Voltage (V_{DS}=0V)	V_{GS}	±20	V
Drain Current (DC) at Tc=25℃	$I_{D\ (DC)}$	78	A
Drain Current (DC) at Tc=100℃	$I_{D\ (DC)}$	55	A
Drain Current-Continuous@ Current-Pulsed (Note 1)	$I_{DM\ (pluse)}$	300	A
Peak diode recovery voltage	dv/dt	30	V/ns
Maximum Power Dissipation(Tc=25℃)	P_D	160	W
Derating factor		1.07	W/℃
Single pulse avalanche energy (Note 2)	E_{AS}	550	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 175	℃
Thermal Resistance，Junction-to-Case（Maximum）	R_{thJC}	0.94	℃/W
Thermal Resistance，Junction-to-Ambient （Maximum）	R_{thJA}	63	℃/W

Electrical Characteristics at T_j=25 ℃ unless otherwise specified

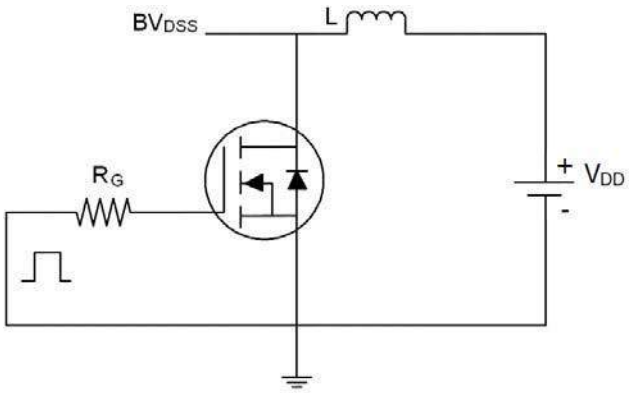
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	80		-	V
Zero Gate Voltage Drain Current(Tc=25℃)	I_{DSS}	V_{DS}=75V,V_{GS}=0V	-	-	1	μA
Zero Gate Voltage Drain Current(Tc=125℃)	I_{DSS}	V_{DS}=75V,V_{GS}=0V	-	-	10	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	2		4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=40A	-	8.5	10	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=30A	-	60	-	S
Input Capacitance	C_{lss}	V_{DS}=25V,V_{GS}=0V, F=1.0MHz	-	3400	-	PF
Output Capacitance	C_{oss}		-	290	-	PF
Reverse Transfer Capacitance	C_{rss}		-	221	-	PF
Total Gate Charge	Q_g	V_{DS}=30V,I_D=30A, V_{GS}=10V	-	94	-	nC
Gate-Source Charge	Q_{gs}		-	16	-	nC
Gate-Drain Charge	Q_{gd}		-	24	-	nC
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=30V,I_D=2A,R_L=15Ω V_{GS}=10V,R_G=2.5Ω	-	15	-	nS
Turn-on Rise Time	t_r		-	11	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	52	-	nS
Turn-Off Fall Time	t_f		-	13	-	nS
Source-drain current(Body Diode)	I_{SD}		-	-	78	A
Pulsed Source-drain current(Body Diode)	I_{SDM}		-	-	312	A
Forward on voltage (Note 1)	V_{SD}	Tj=25℃,I_{SD}=40A,V_{GS}=0V	-	-	1.2	V
Reverse Recovery Time (Note 1)	t_{rr}	Tj=25℃,I_F=75A,di/dt=100A/μs	-	-	33	nS
Reverse Recovery Charge (Note 1)	Q_{rr}		-	-	54	nC
Forward Turn-on Time	t_{on}	Intrinsic turn-on time is negligible(turn-on is dominated by L_S+L_D)				

Note

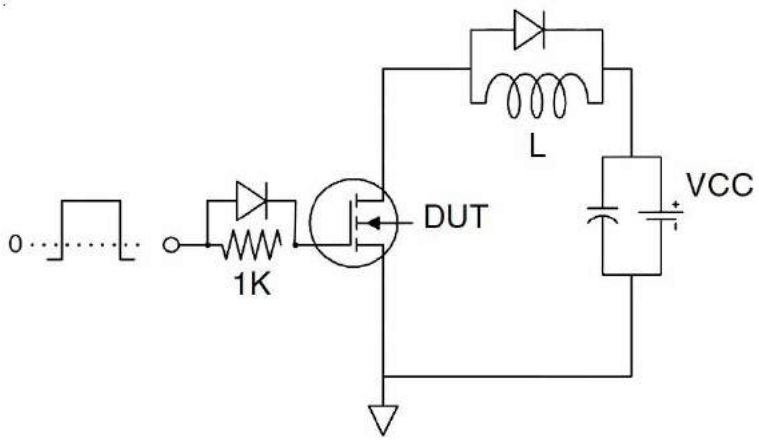
1) Calculated continuous current based on maximum allowable junction temperature.
2) Repetitive rating; pulse width limited by max. junction temperature.
3) Pd is based on max. junction temperature, using junction-case thermal resistance.
4) The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25 ℃.

Test Circuit

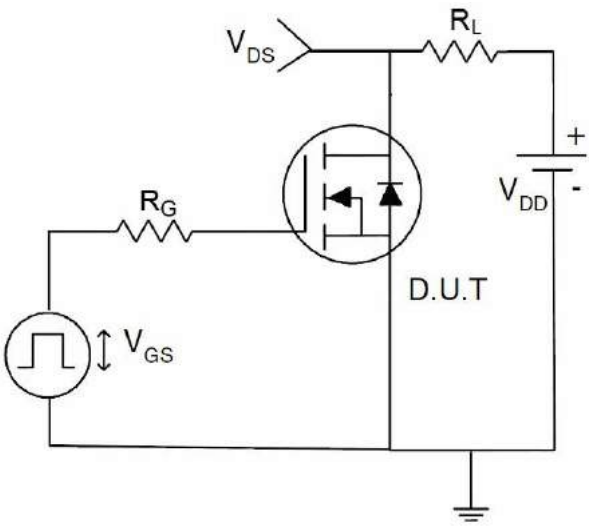
1) E_{AS} test circuit



2) Gate charge test circuit



3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics (curves)

Figure1. Safe operating area

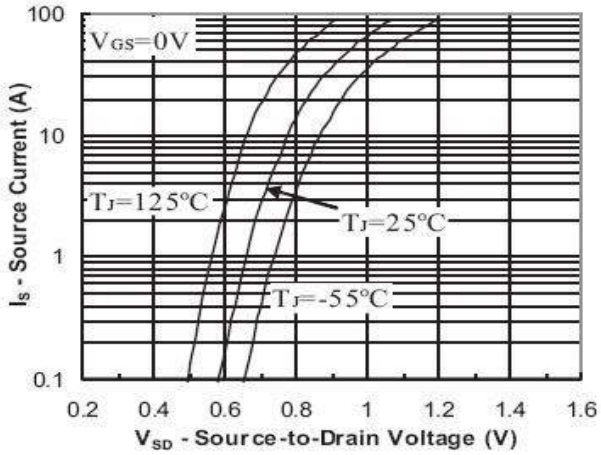


Figure2. Source-Drain Diode Forward Voltage

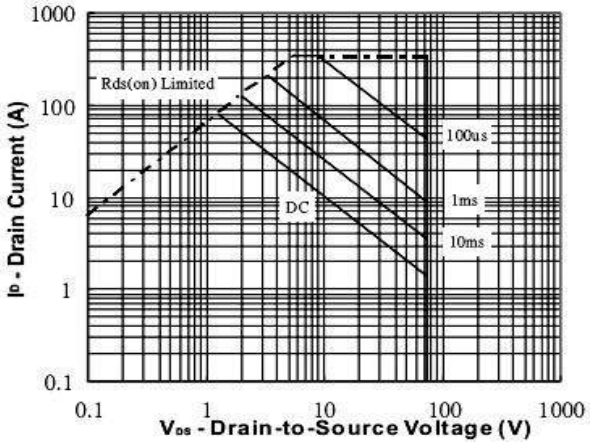


Figure3. Output characteristics

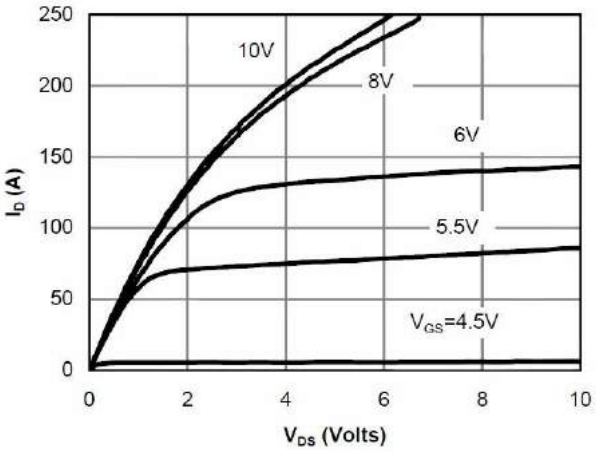


Figure4. Transfer characteristics

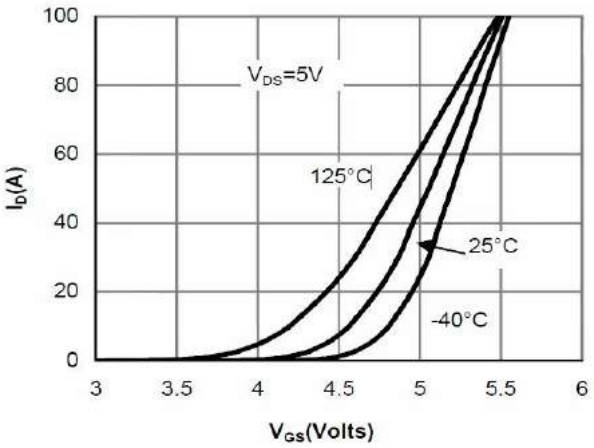


Figure5. Static drain-source on resistance

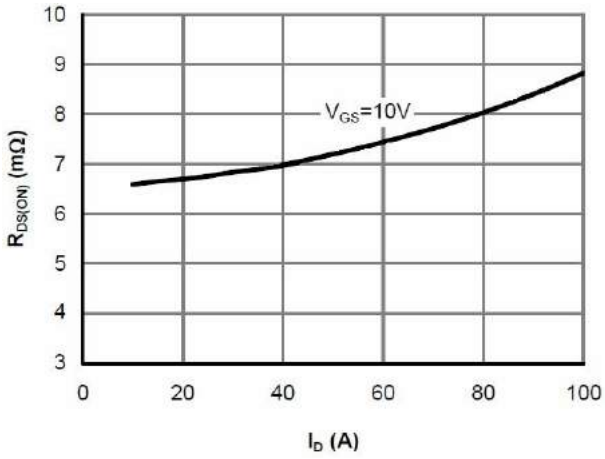


Figure6. $R_{DS(ON)}$ vs Junction Temperature

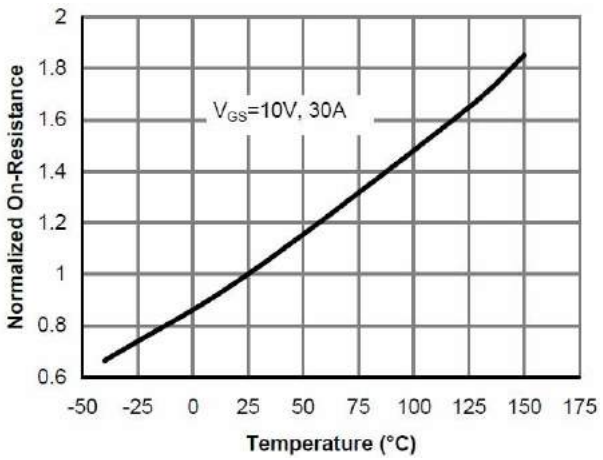


Figure7. BV_{DSS} vs Junction Temperature

Figure8. $V_{GS(th)}$ vs Junction Temperature

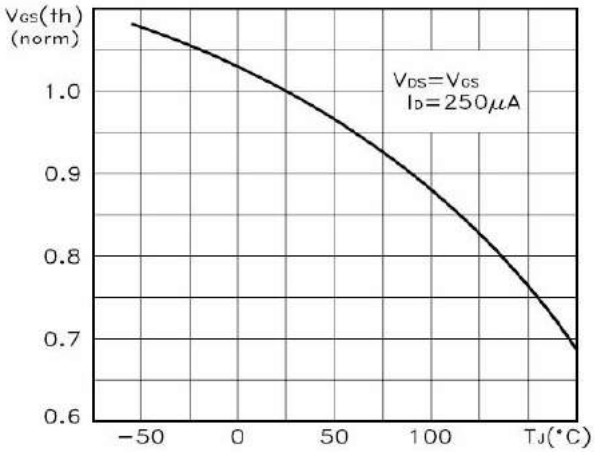


Figure9. Capacitance

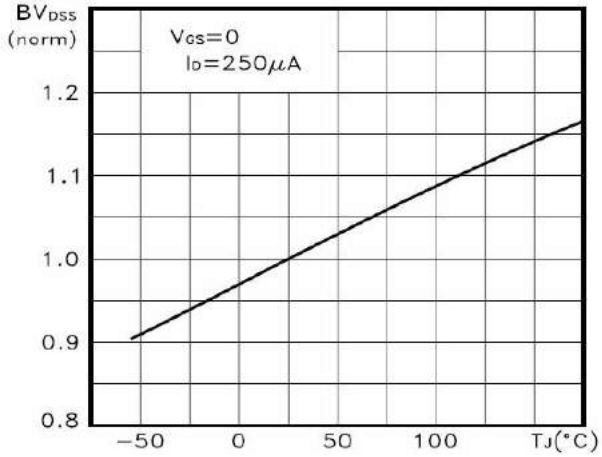
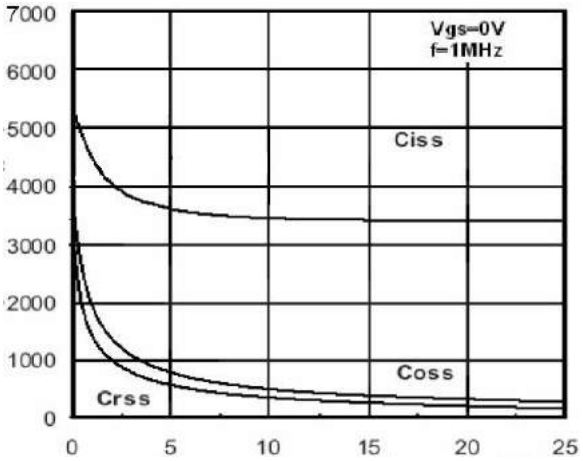


Figure10. Gate charge waveforms



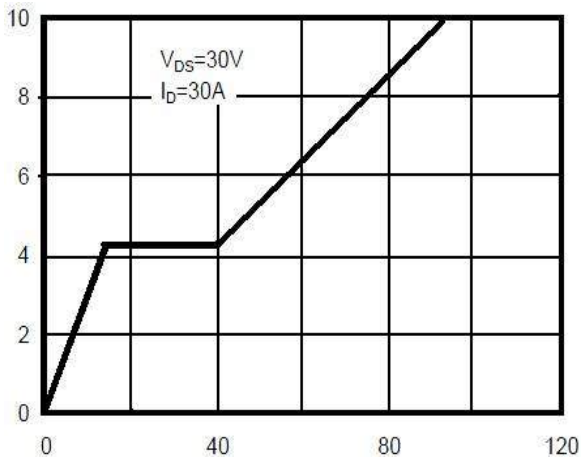
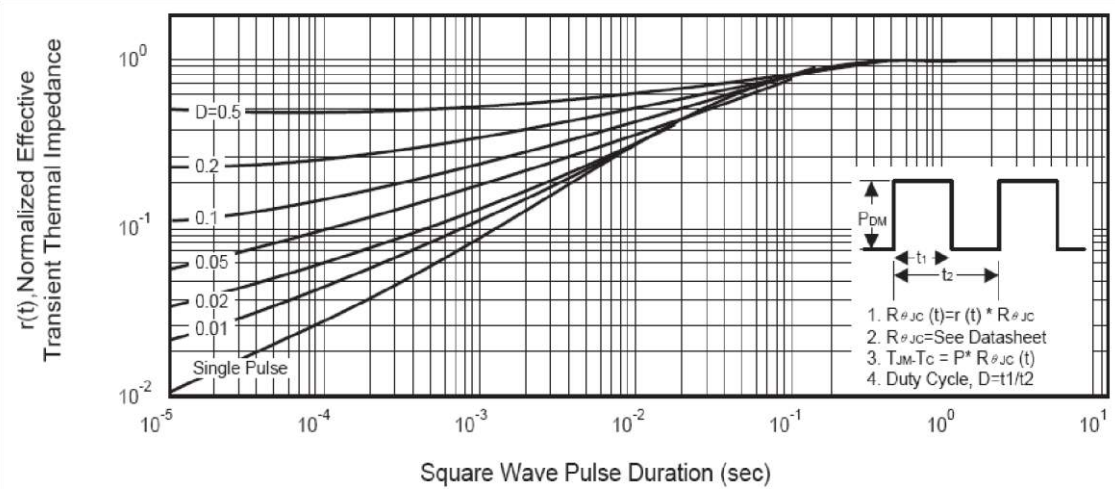


Figure11. Normalized Maximum Transient Thermal Impedance



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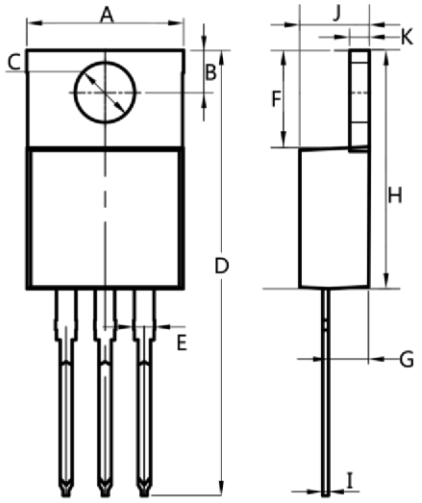

Dim.	Min.	Max.
A	10.0	10.4
B	2.5	3.0
C	3.5	4.0
D	28.0	30.0
E	1.1	1.5
F	6.2	6.6
G	2.9	3.3
H	15.0	16.0
I	0.35	0.45
J	4.3	4.7
K	1.2	1.4
All Dimensions in millimeter		

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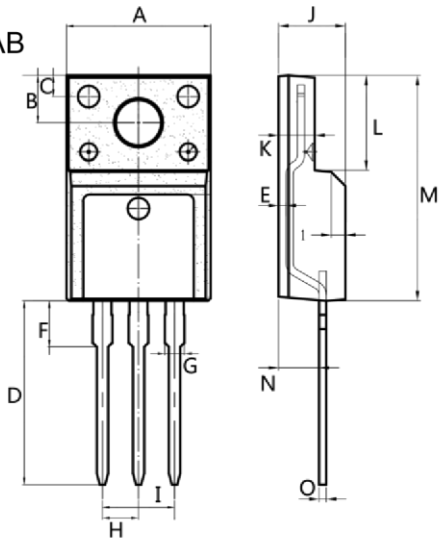

Dim.	Min.	Max.
A	9.9	10.3
B	2.9	3.5
C	1.15	1.45
D	12.75	13.25
E	0.55	0.75
F	3.1	3.5
G	1.25	1.45
H	Typ 2.54	
I	Typ 5.08	
J	4.55	4.75
K	2.4	2. 7
L	6.35	6.75
M	15.0	16.0
N	2.75	3.15
O	0.45	0.60
All Dimensions in millimeter		

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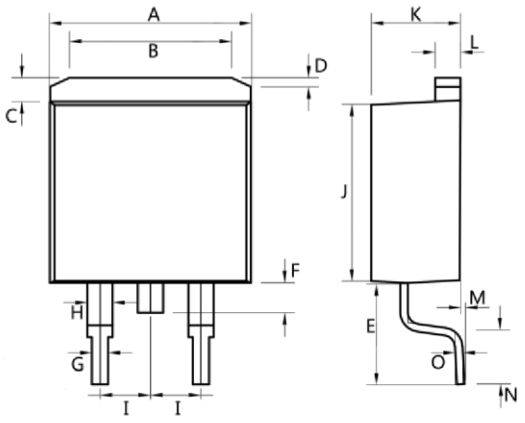

Dim.	Min.	Max.
A	10.0	10. 5
B	7.25	7.75
C	1.3	1.5
D	0.55	0.75
E	5.0	6.0
F	1.4	1.6
G	0.75	0.95
H	1.15	1.35
I	Typ 2.54	
J	8.4	8.6
K	4.4	4.6
L	1.25	1.45
M	0.02	0.1
N	2.4	2.8
O	0.35	0.45
All Dimensions in millimeter		