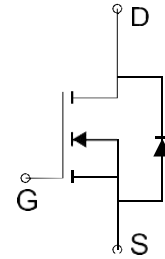


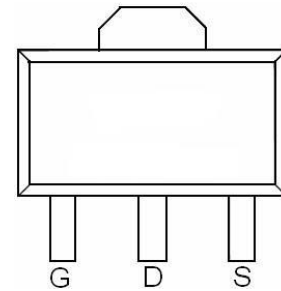
General Description:

The 5N10 is the single N-Channel logic enhancement mode power field effect transistors to provide excellent $R_{DS(on)}$, low gate charge and low gate resistance. It's up to 30V operation voltage is well suited in switching mode power supply, SMPS, notebook computer power management and other battery powered circuits.



Features:

$R_{DS(ON)} < 125m\Omega @ V_{GS} = 10V$ (N-Ch)
 $R_{DS(ON)} < 135m\Omega @ V_{GS} = 4.5V$ (N-Ch)
 Super high density cell design for extremely low RDS(ON)
 Exceptional on-resistance and maximum DC current



Applications:

Switching power supply, SMPS
 Battery Powered System
 DC/DC Converter
 DC/AC Converter
 Load Switch

Table 1. Absolute Maximum Ratings ($T_A = 25^\circ C$)

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage ($V_{GS} = 0V$)	100	V
VGS	Gate-Source Voltage ($V_{DS} = 0V$)	± 25	V
ID	Drain Current-Continuous ($T_c = 25^\circ C$)	5	A
	Drain Current-Continuous ($T_c = 100^\circ C$)	3.1	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed (Note 1)	20	A
PD	Maximum Power Dissipation	9.3	W
TJ, TSTG	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ C$

Notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Value	Unit
RJA	Thermal Resistance, Junction-to-Ambient	-	13.5	$^\circ C / W$

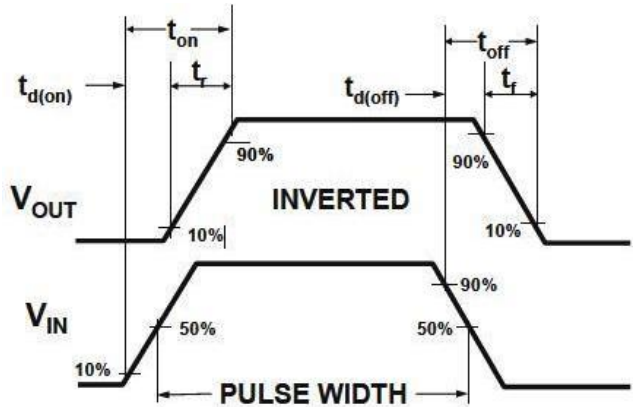
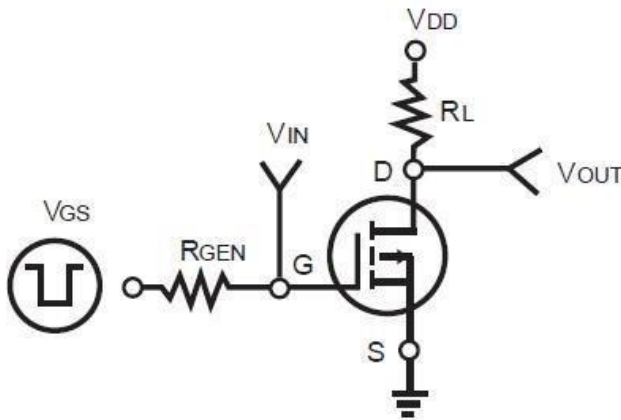
Table 3. Electrical Characteristics (T_A=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	100			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =100V, V _{GS} =0V			100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1	1.5	3	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =10A		110	125	mΩ
		V _{GS} =4.5V, I _D =-5A		120	135	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1.0MHz		690		pF
C _{oss}	Output Capacitance			120		pF
C _{rss}	Reverse Transfer Capacitance			90		pF
Switching Times						
t _{d(on)}	Turn-on Delay Time	V _{DD} =15V, I _D =1A, R _L =15 V _{GS} =10V, R _G =2.5		11		nS
t _r	Turn-on Rise Time			7.4		nS
t _{d(off)}	Turn-Off Delay Time			35		nS
t _f	Turn-Off Fall Time			9.1		nS
Q _g	Total Gate Charge	V _{DS} =15V, I _D =10A, V _{GS} =10V		15.5		nC
Q _{gs}	Gate-Source Charge			3.2		nC
Q _{gd}	Gate-Drain Charge			4.7		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current(Body Diode)				20	A
V _{SD}	Forward on Voltage ^(Note 1)	V _{GS} =0V, I _S =2A			0.8	V

Notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

100V N-Channel Enhancement Mode MOSFET

Switch Time Test Circuit and Switching Waveforms:



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure1. Output Characteristics

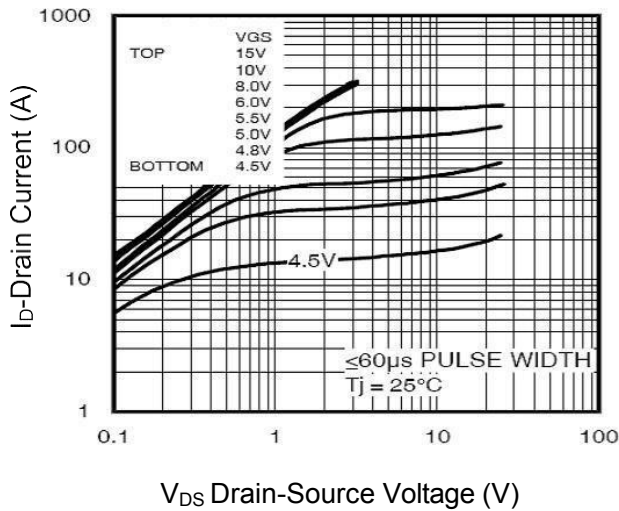


Figure2. Transfer Characteristics

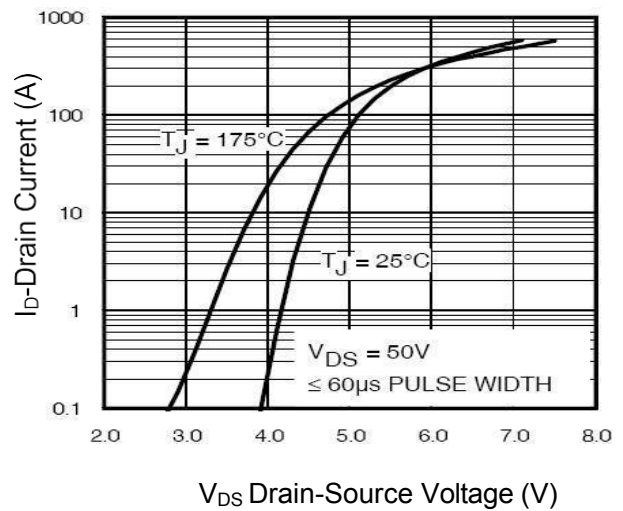


Figure3. BV_{DSS} vs Junction Temperature

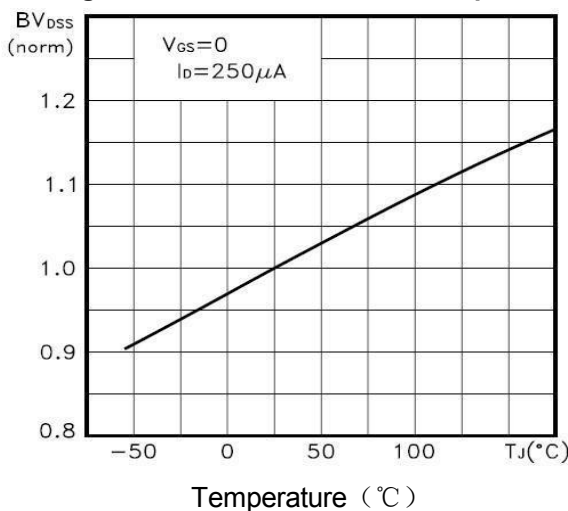
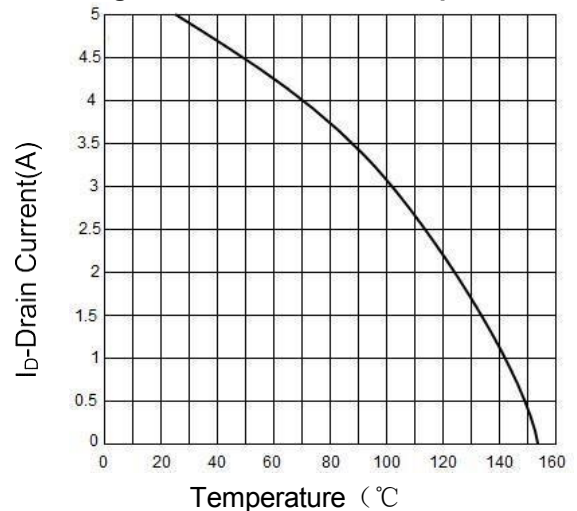
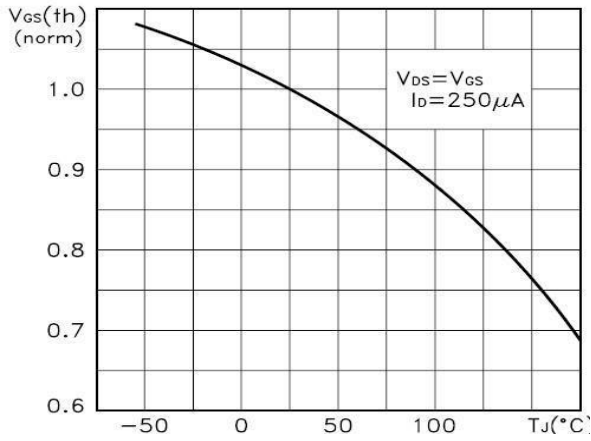
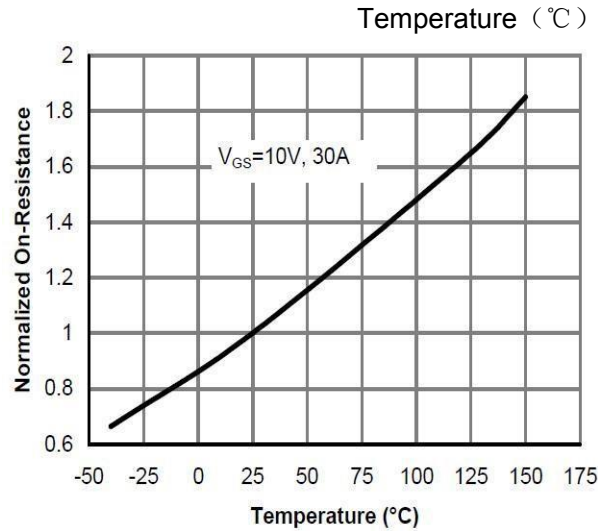
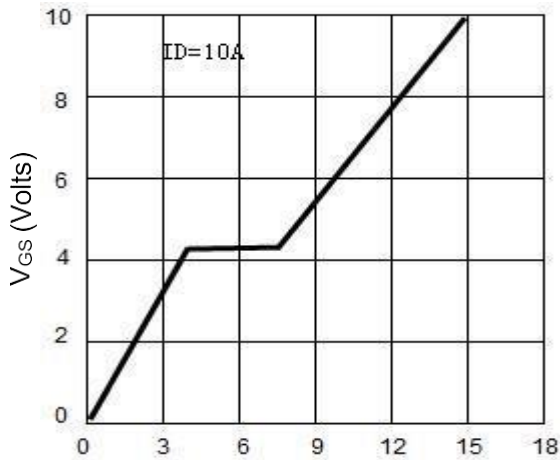
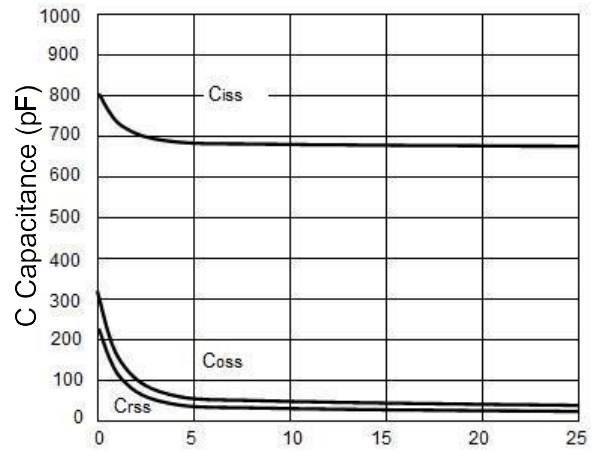
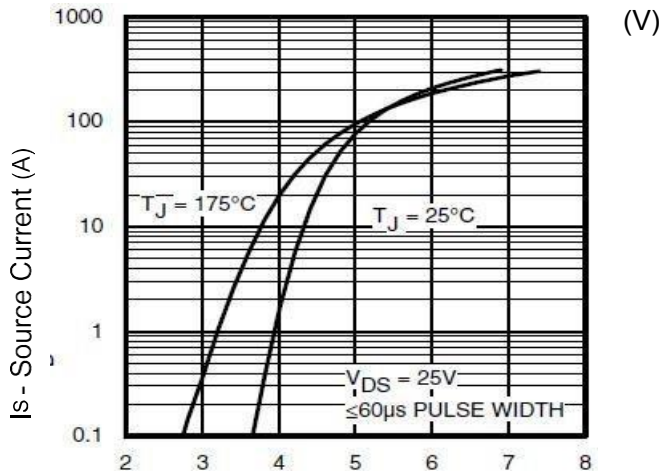
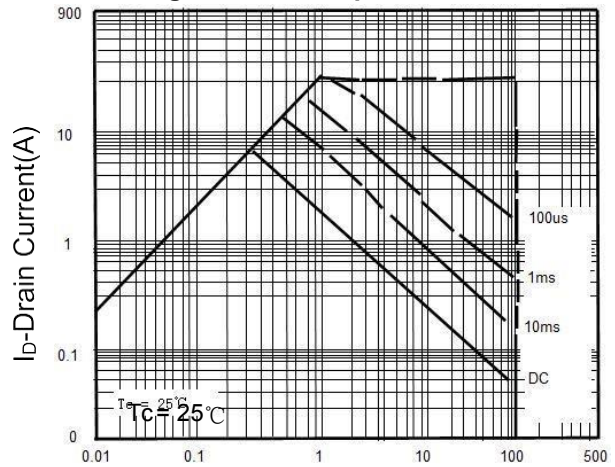


Figure4. ID vs Junction Temperature



100V N-Channel Enhancement Mode MOSFET
Figure5. VGS(th) vs Junction Temperature

Figure6. Rdson Vs Junction Temperature

Figure7. Gate Charge

Figure8. Capacitance vs Vds

Figure9. Source-Drain Diode Forward

Figure10. Safe Operation Area Voltage


100V N-Channel Enhancement Mode MOSFET

Figure11. Normalized Maximum Transient Thermal Impedance

