Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	13.5mΩ@10V	10A
	16.5mΩ@4.5V	

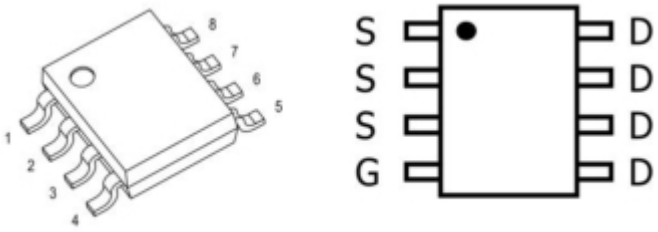
Feature

- Fast Switching
- Extremely low switching loss
- Excellent Rdson and Low Gate Charge

Applications

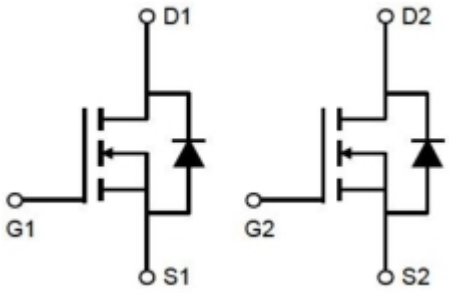
- Power Management
- Switched mode power supply

Package

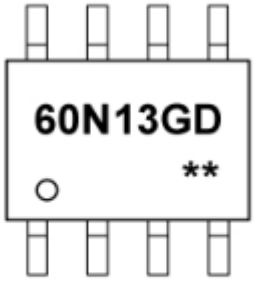


SOP-8L

Circuit diagram



Marking



60N13GD =Device Code
** =Week Code

Absolute maximum ratings

(T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	60	V
Gate-source voltage	V_{GS}	±20	V
Continuous drain current[1], T_C=25 °C	I_D	10	A
Pulsed drain current[2], T_C=25 °C	I_{DM}	40	A
Power dissipation[3]	P_D	3.5	W
Single pulsed avalanche energy[4]	E_{AS}	95	mJ
Thermal resistance, junction-Ambient	$R_{\theta JA}$	37.8	°C/W
Operation and storage temperature	$T_{STG,}$ T_J	-55 to 150	°C

Electrical characteristics

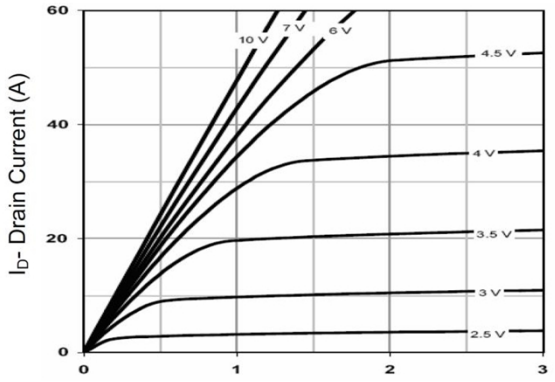
(T_A=25℃, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$BV_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	60			V
Gate-Body Leakage Current	I_{GSS}	V_{GS} =±20V			±100	uA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =48V, V_{GS} = 0V			1	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1	1.8	2.5	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =8A		13.5	17	mΩ
		V_{GS} =4.5V, I_D =8A		16.5	21	
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz		980		pF
Output capacitance	C_{oss}			240		
Reverse transfer capacitance	C_{rss}			9.5		
Total Gate Charge	Q_g	V_{GS}=10V, V_{DS}=30V , I_D =10A		22		pF
Gate-Source Charge	Q_{gs}			5		
Gate-Drain Charge	Q_{gd}			4.2		
Switching Characteristics						
Turn-on Delay Time	$T_{d(on)}$	V_{GS}=10V, V_{DD}=30V, R_G =1.6Ω, I_D =10A		12		nS
Turn-on Rise Time	T_r			18		
Turn-Off Delay Time	$T_{d(off)}$			19		
Turn-Off Fall Time	t_f			5		
Drain-Source Body Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V ,I_S=1A			1.2	V

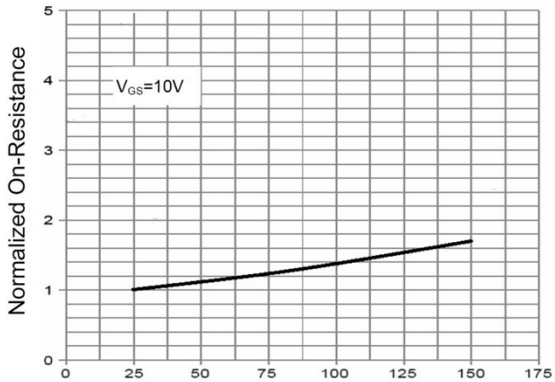
Note：

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. V_{DD}=30 V,V_{GS}=10 V, L=0.5 mH, starting T_j=25 °C.

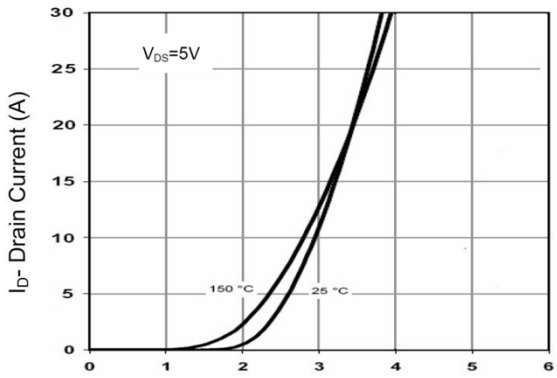
Typical Characteristics



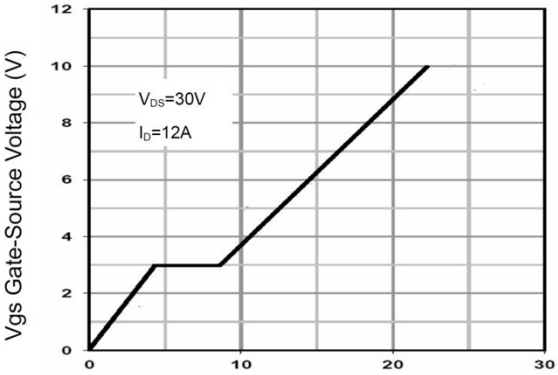
Output Characteristics



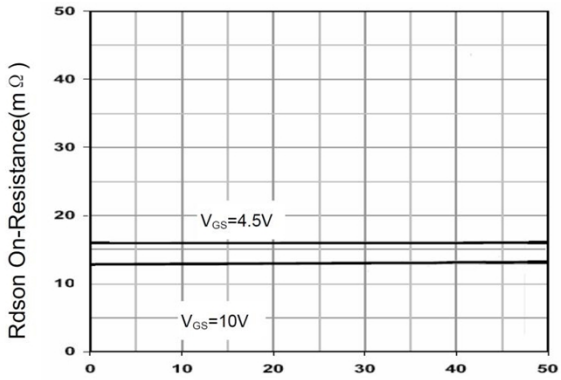
Rdson-Junction Temperature



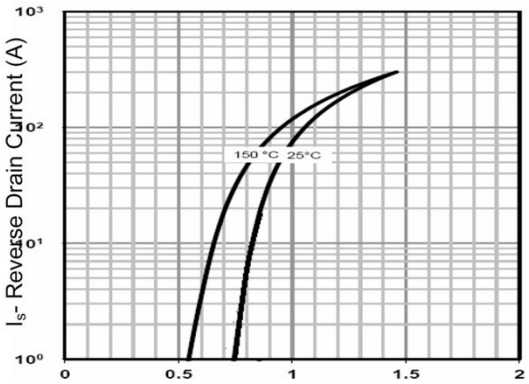
Transfer Characteristics



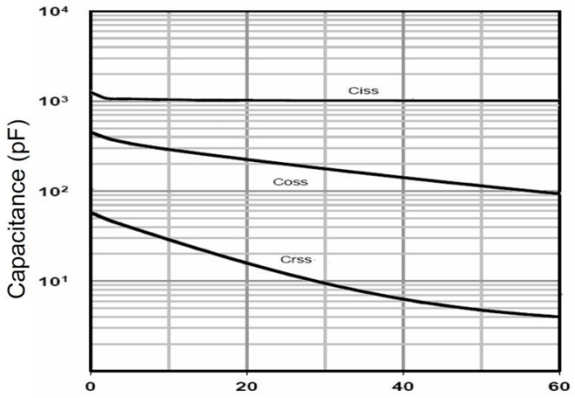
Gate Charge



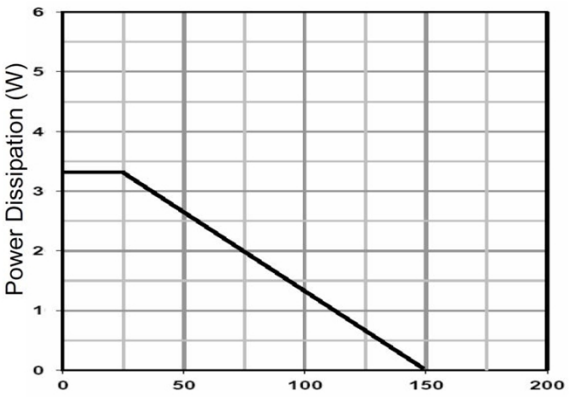
Rdson- Drain Current



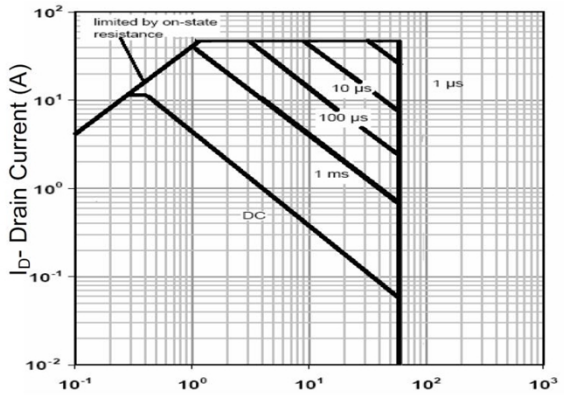
Source- Drain Diode Forward



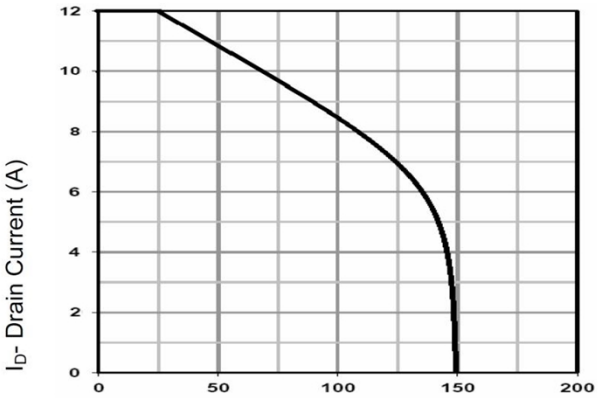
Capacitance vs Vds



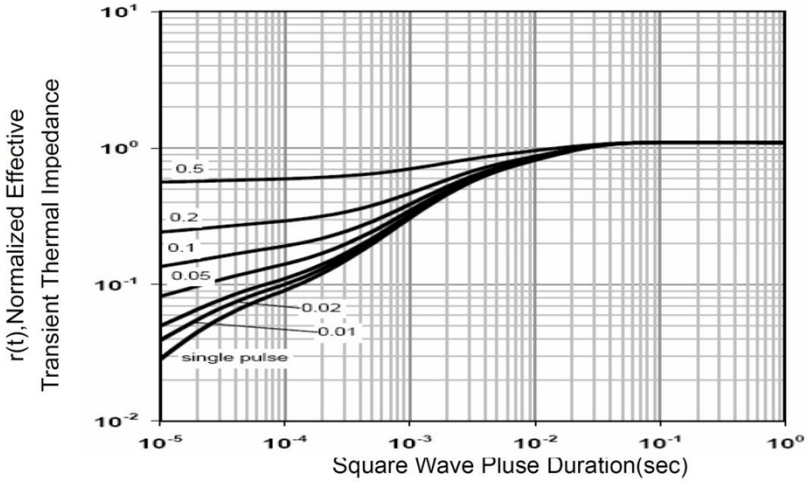
Power De-rating



Safe Operation Area

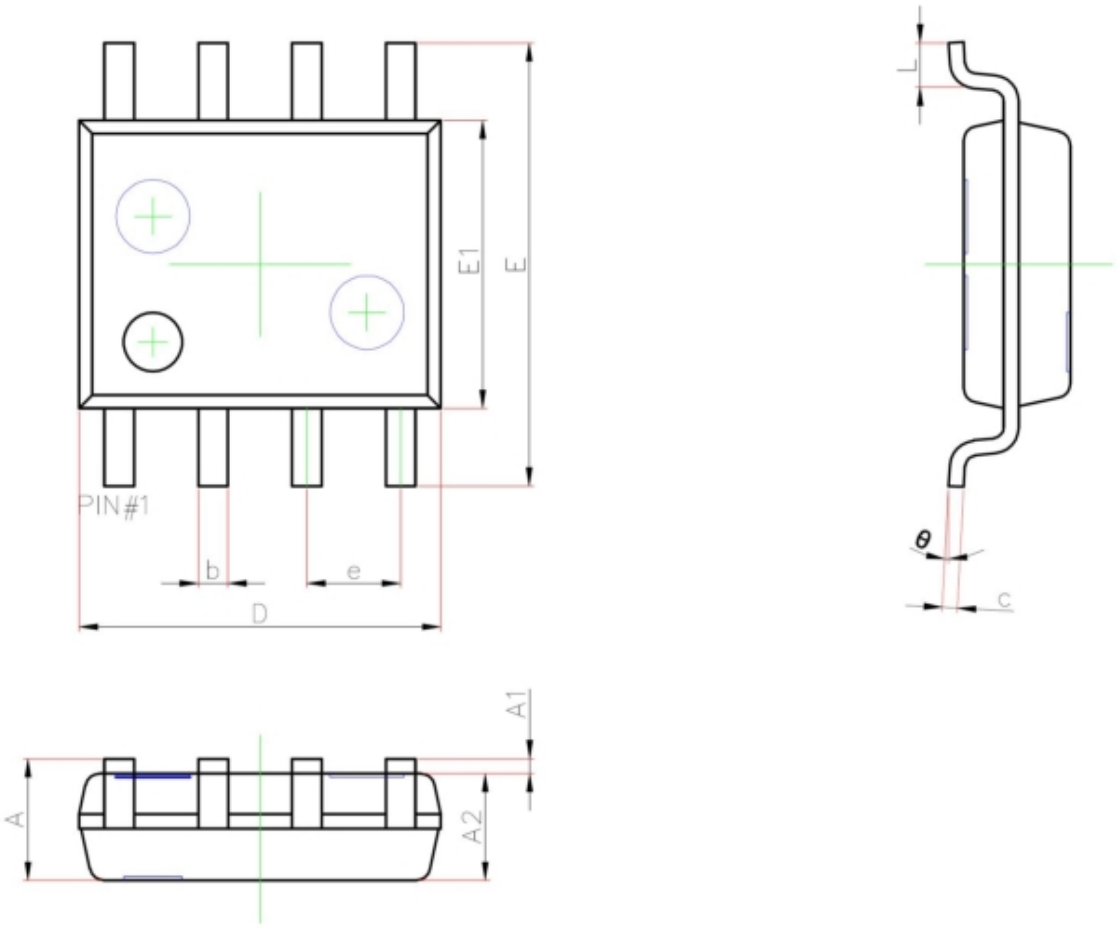


Current De-rating



Normalized Maximum Transient Thermal Impedance

SOP-8 Package Information



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.35	1.75
A1	0.10	0.25
A2	1.35	1.55
b	0.33	0.51
c	0.17	0.25
D	4.80	5.00
e	1.27 REF.	
E	5.80	6.20
E1	3.80	4.00
L	0.40	1.27
θ	0°	8°