Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	13mΩ@10V	9A
	18mΩ@4.5V	

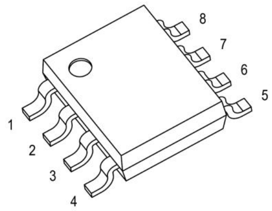
Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Low gate to drain charge to reduce switching losses

Application

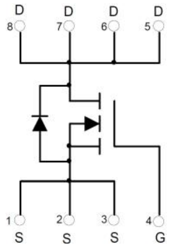
- Power switching application
- Load switch

Package

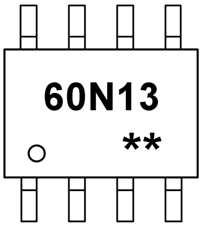


SOP-8L

Circuit diagram



Marking



60N13 : **Product code**
****** : **Week code.**

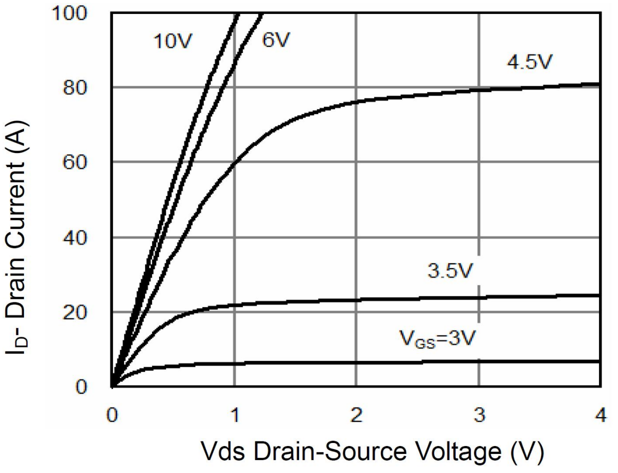
Absolute maximum ratings (Ta=25℃ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	9	A
Pulsed Drain Current(1)	I_{DM}	36	A
Maximum Power Dissipation	P_D	2.1	W
Thermal Resistance,Junction-to-Case(2)	$R_{\theta JC}$	60	℃/W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

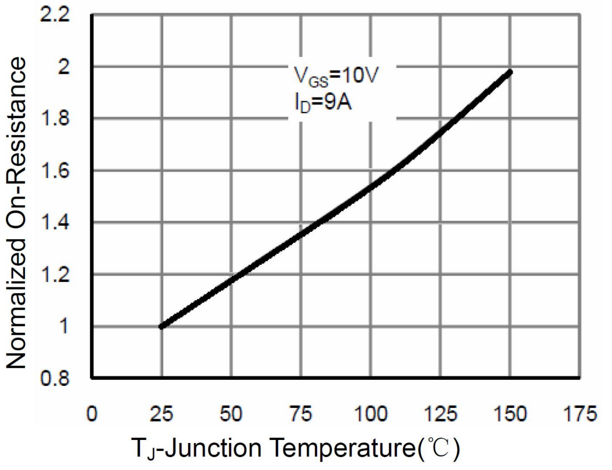
Electrical characteristics (T_A=25 °C, unless otherwise noted)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Static Electrical Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS = 0V, ID = 250μA	60			V
Zero Gate Voltage Drain Current	I_{DSS}	VDS = 60V, VGS = 0V			1	μA
Gate-Source Leakage	I_{GSS}	VGS = ±20V, VDS = 0V			±100	nA
Gate Threshold Voltage	$V_{GS(TH)}$	VDS = VGS, ID = 250μA	1	1.6	2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	VGS = 10V, ID = 10A		13	18	mΩ
		VGS = 4.5V, ID = 6A		18	26	
Dynamic Characteristics						
Input Capacitance	C_{iss}	VDS = 30V, VGS = 0V,f = 1MHz		2750		pF
Output Capacitance	C_{oss}			170		
Reverse Transfer Capacitance	C_{rss}			150		
Total Gate Charge	Q_g	VDS = 30V, ID = 10A		60		nC
Gate-Source Charge	Q_{gs}			10		
Gate-Drain Charge	Q_{gd}			14		
Switching Characteristics						
Turn-On Delay Time	$t_{D(ON)}$	VGS = 10V, VDS = 30V, RG = 6Ω, ID = 10A		9		ns
Turn-On Rise Time	t_R			7		
Turn-Off Delay Time	$t_{D(OFF)}$			33		
Turn-Off Fall Time	t_F			7		
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	VGS = 0V, IS = 1A		0.7	1.2	V
Reverse Recovery Time	t_{RR}	IF = 10A, di/dt = 100A/μs		22		ns
Reverse Recovery Charge	Q_{RR}			11		nC

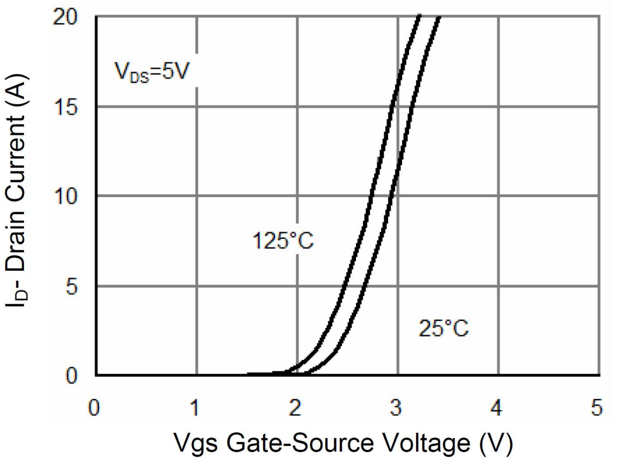
Typical Characteristics



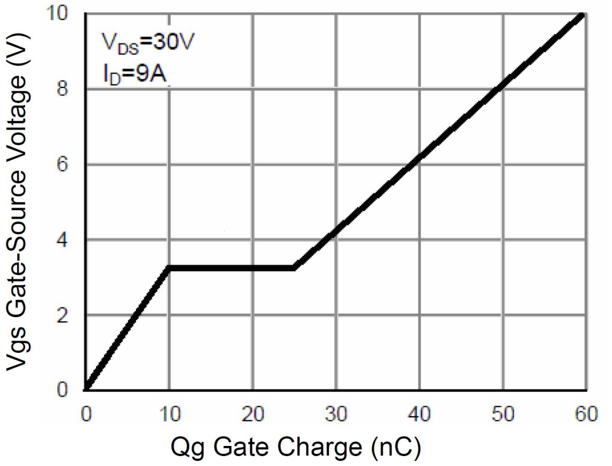
Output Characteristics



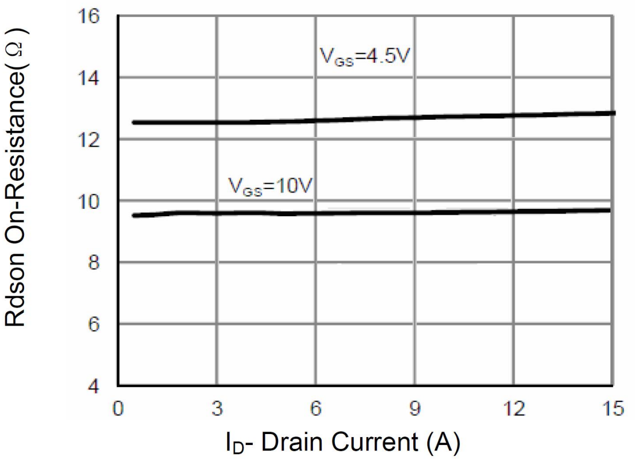
Rdson-JunctionTemperature



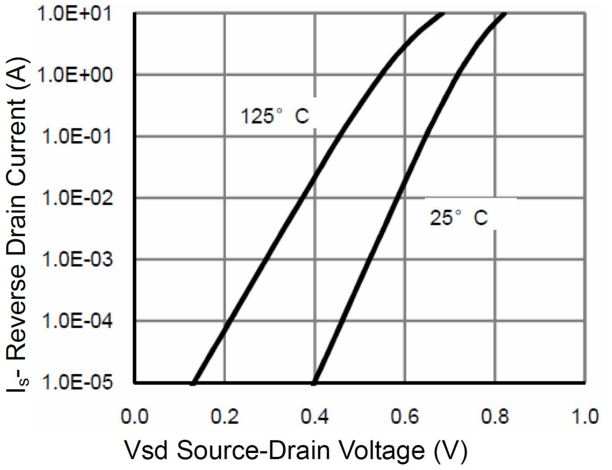
Transfer Characteristics



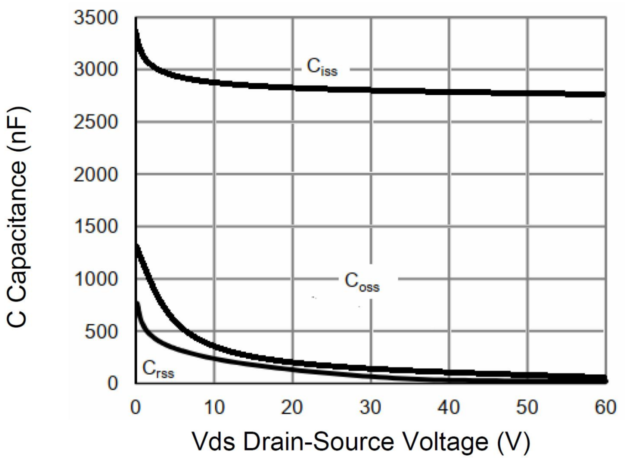
Gate Charge



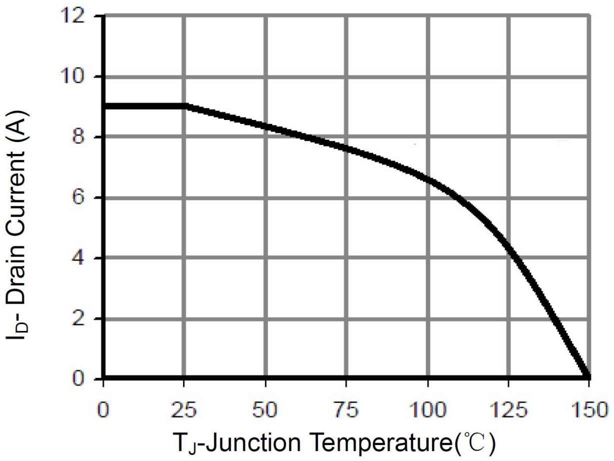
Rdson- Drain Current



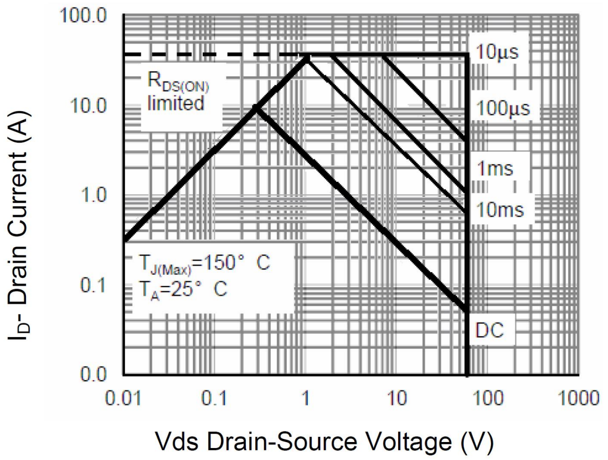
Drain Diode Forward



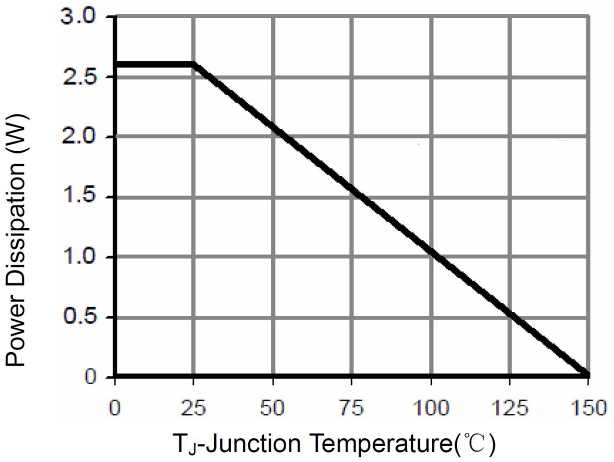
Capacitance vs Vds



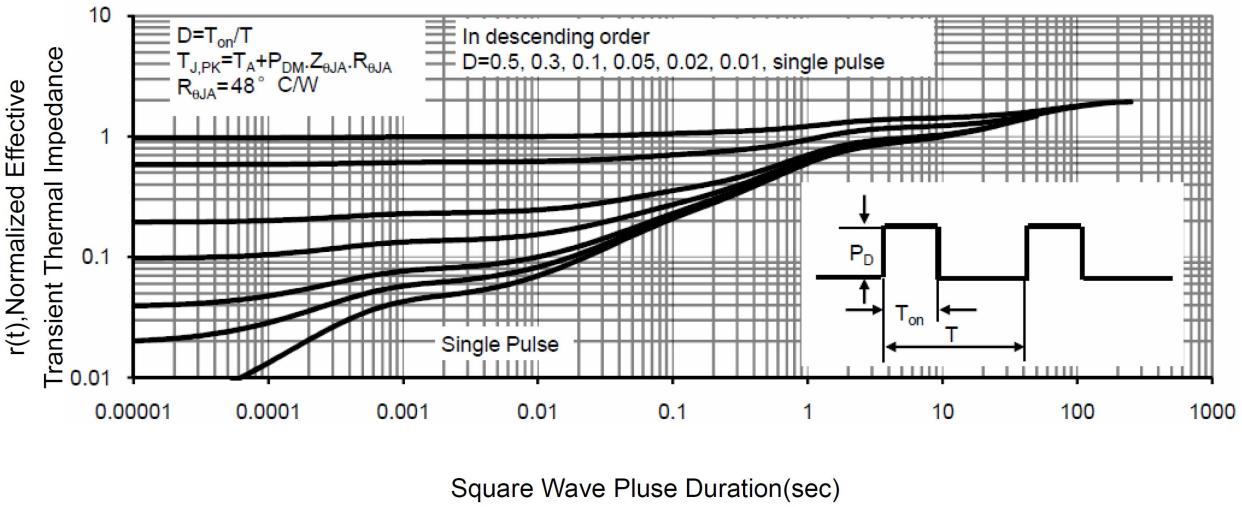
Current De-rating



Safe Operation Area

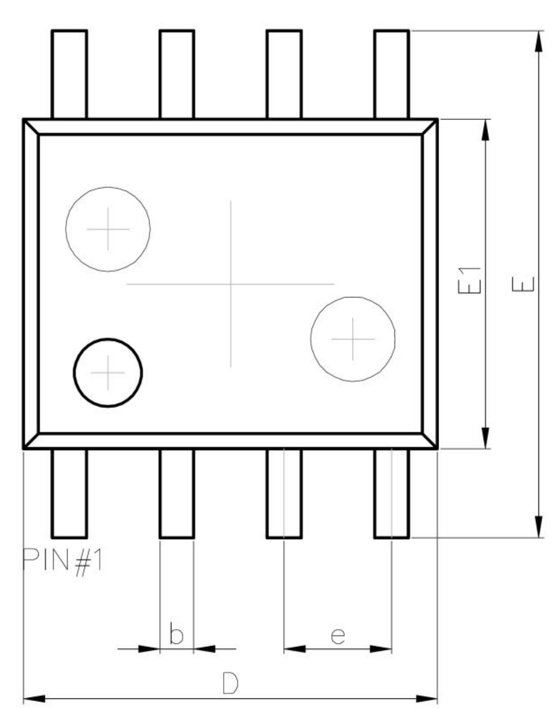


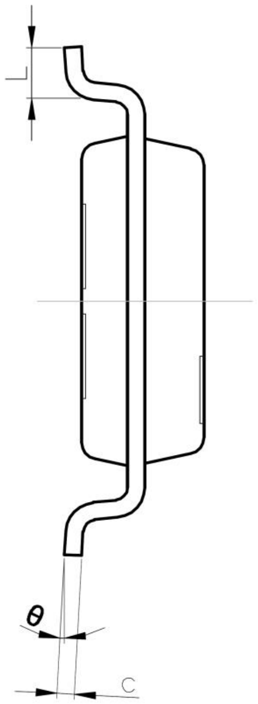
Power De-rating

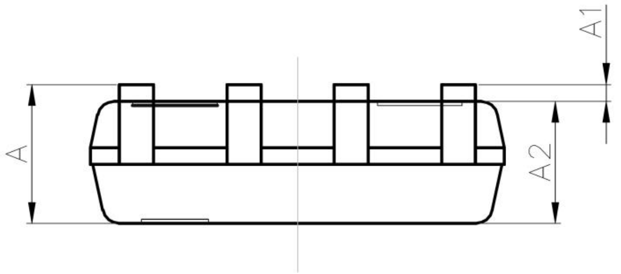


Normalized Maximum Transient Thermal Impedance

SOP-8L 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°