N-Channel Enhancement Mode Power MOSFET

Description

The G450N06HA uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

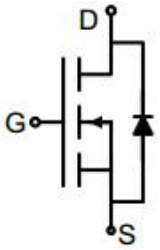
AEC-Q101 Qualified

General Features

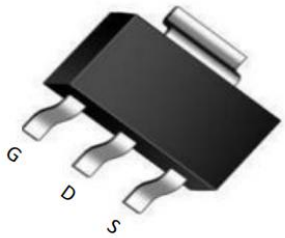
- V_{DS} 60V
- I_D (at V_{GS} = 10V) 6A
- $R_{DS(ON)}$ (at V_{GS} = 10V) < 45mΩ
- $R_{DS(ON)}$ (at V_{GS} = 4.5V) < 50mΩ
- 100% Avalanche Tested
- RoHS Compliant

Application

- Power switch
- DC/DC converters



Schematic diagram



SOT-223

Ordering Information

Device	Package	Marking	Packaging
G450N06HA	SOT-223	G450N06	2500psc/Reel

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	60	V
Continuous Drain Current	T_C = 25ºC	I_D	6	A
	T_C = 100ºC		4.3	
Pulsed Drain Current (note1)		I_{DM}	24	A
Gate-Source Voltage		V_{GS}	±20	V
Power Dissipation		P_D	1.15	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 To 175	ºC

Thermal Resistance

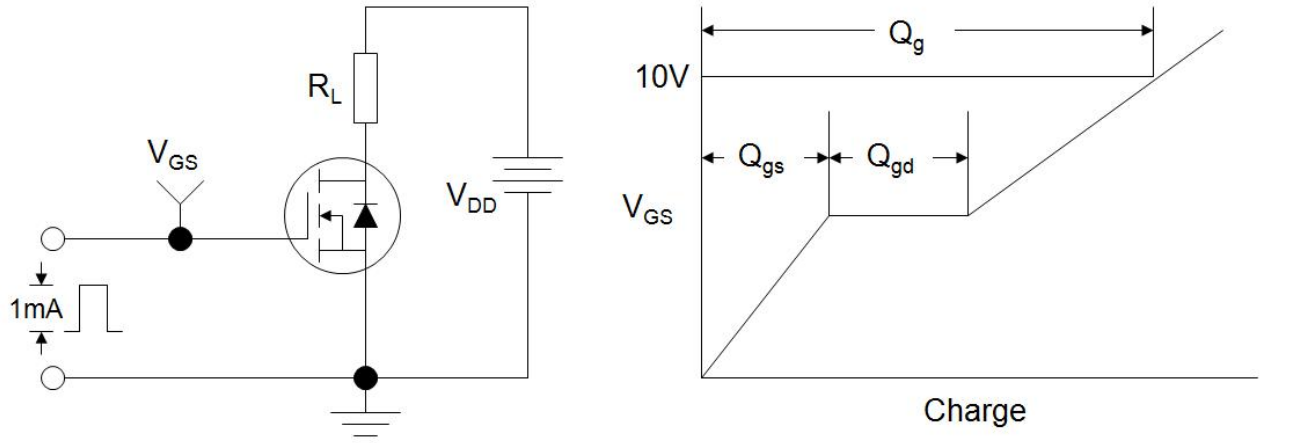
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	130	ºC/W

Specifications T_J = 25ºC, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Value**			**Unit**
			Min.	**Typ.**	**Max.**	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60V, V_{GS} = 0V	--	--	1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.7	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 5A	--	36	45	mΩ
		V_{GS} = 4.5V, I_D = 3A	--	40	50	
Forward Transconductance	g_{FS}	V_{GS} = 5V, I_D = 5A	--	17	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 30V, f = 1.0MHz	--	765	--	pF
Output Capacitance	C_{oss}		--	46	--	
Reverse Transfer Capacitance	C_{rss}		--	40	--	
Total Gate Charge	Q_g	V_{DD} = 30V, I_D = 5A, V_{GS} = 10V	--	8.9	--	nC
Gate-Source Charge	Q_{gs}		--	2.4	--	
Gate-Drain Charge	Q_{gd}		--	1.4	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 30V, I_D = 5A, R_G = 3Ω	--	4.5	--	ns
Turn-on Rise Time	t_r		--	2.5	--	
Turn-off Delay Time	$t_{d(off)}$		--	14.5	--	
Turn-off Fall Time	t_f		--	3.5	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	6	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 5A, V_{GS} = 0V	--	--	1.2	V

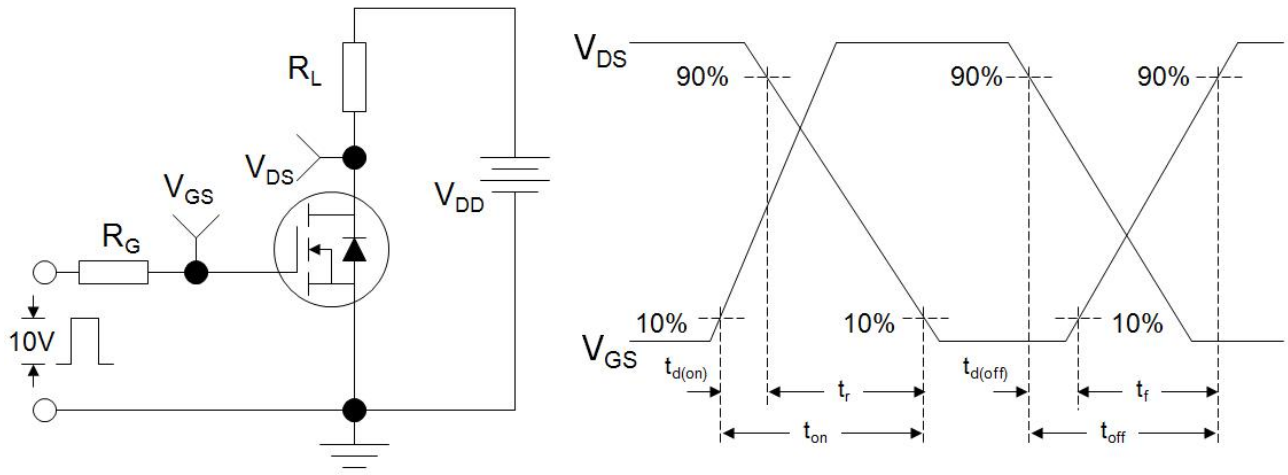
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical R_G

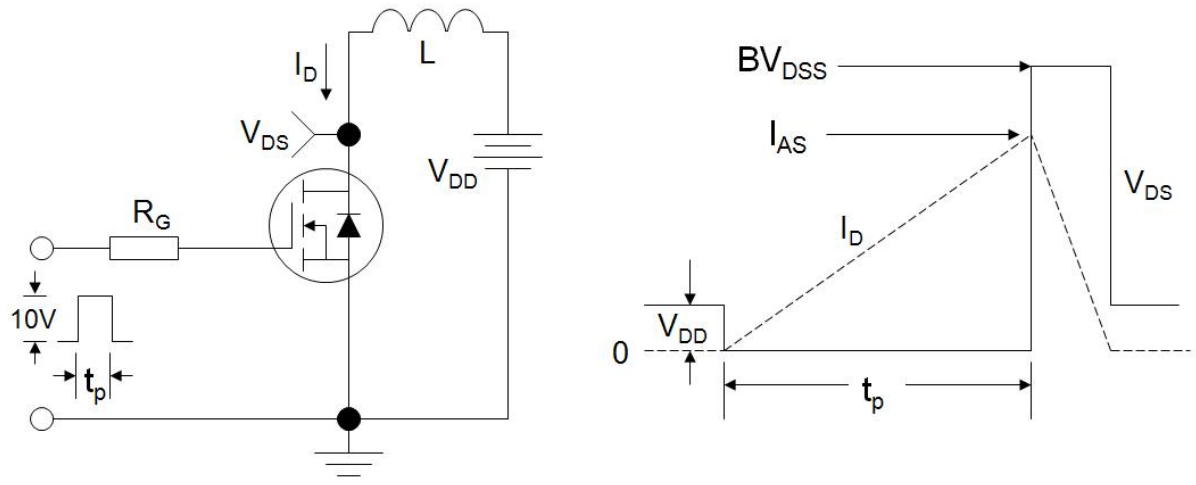
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

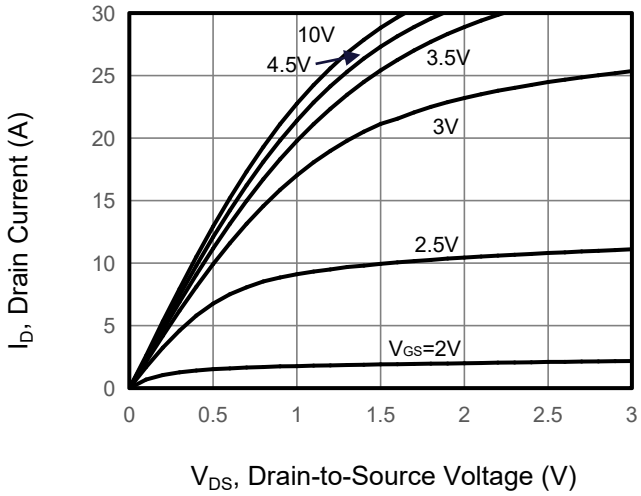


Figure 2. Transfer Characteristics

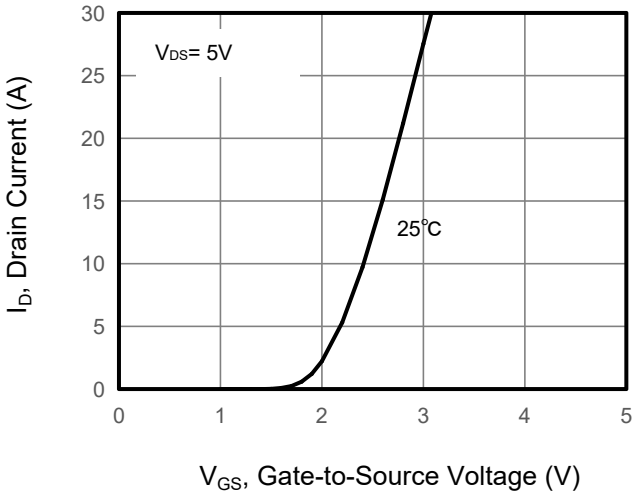


Figure 3. Drain Source On Resistance

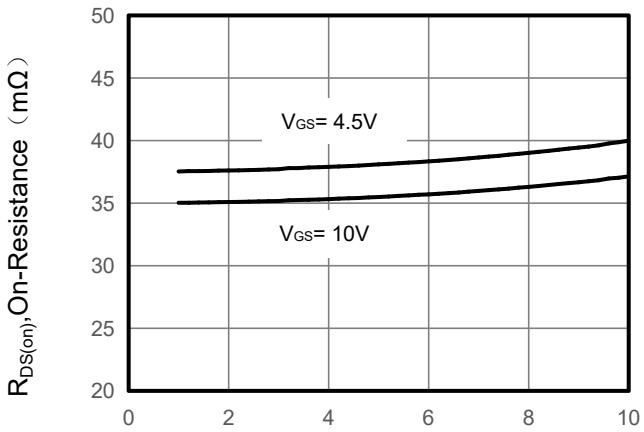


Figure 4. Gate Charge

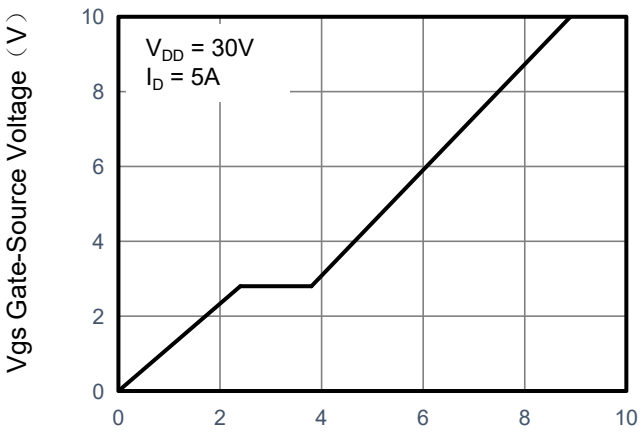


Figure 5. Capacitance

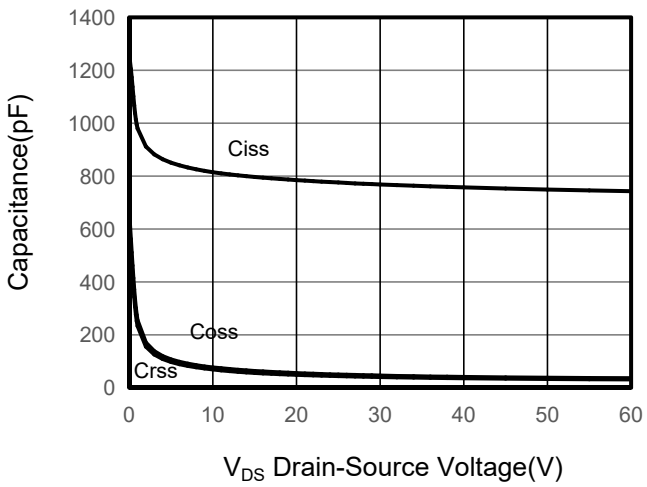
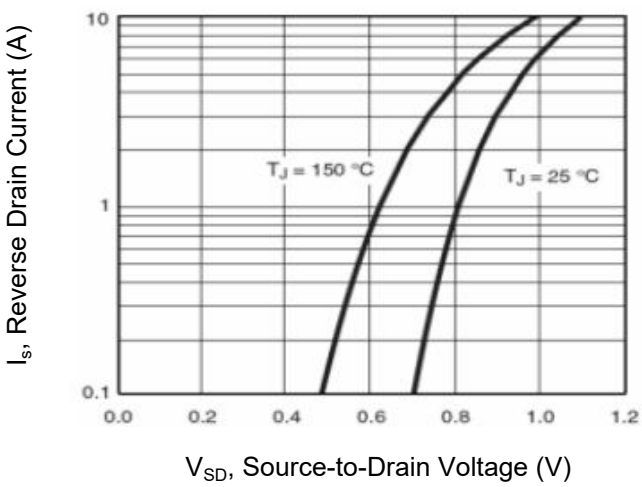


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

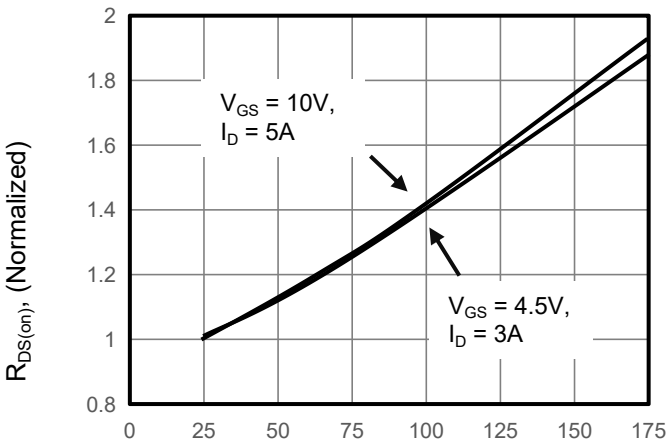


Figure 8. Safe Operation Area

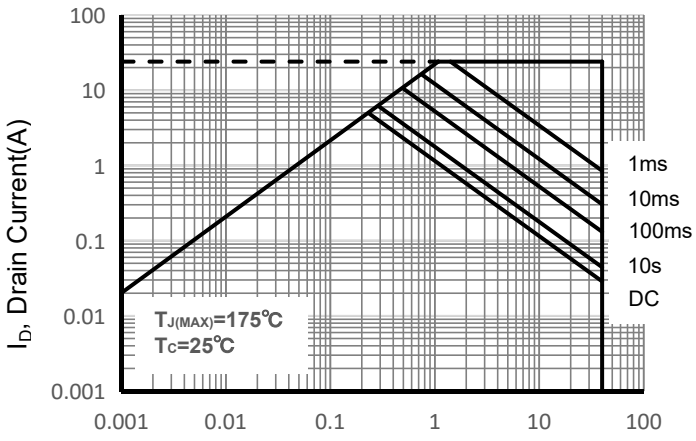


Figure 9. Maximum Continuous Drain Current vs Case Temperature

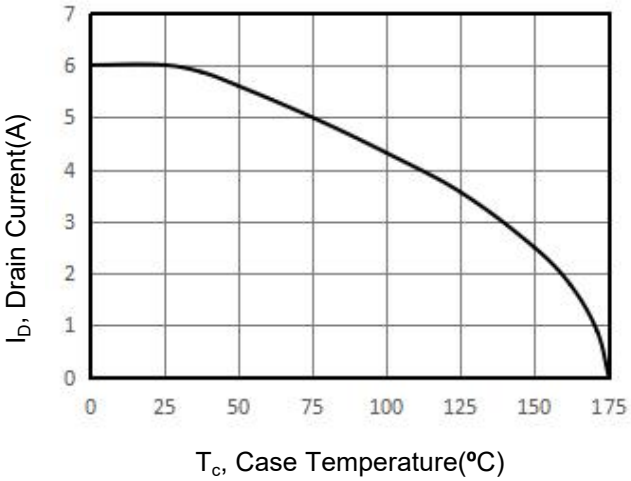
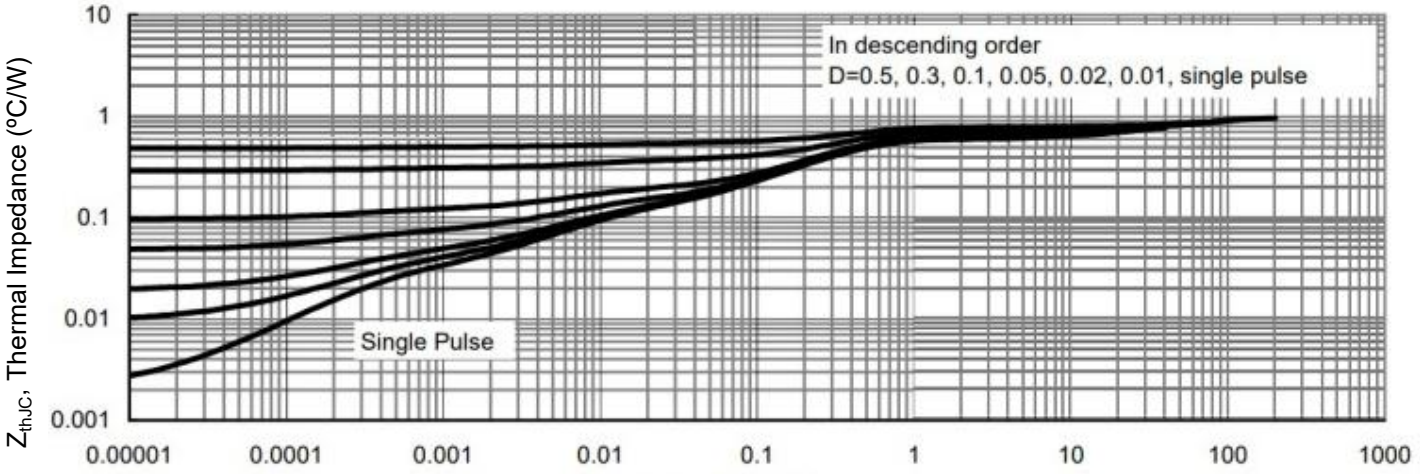
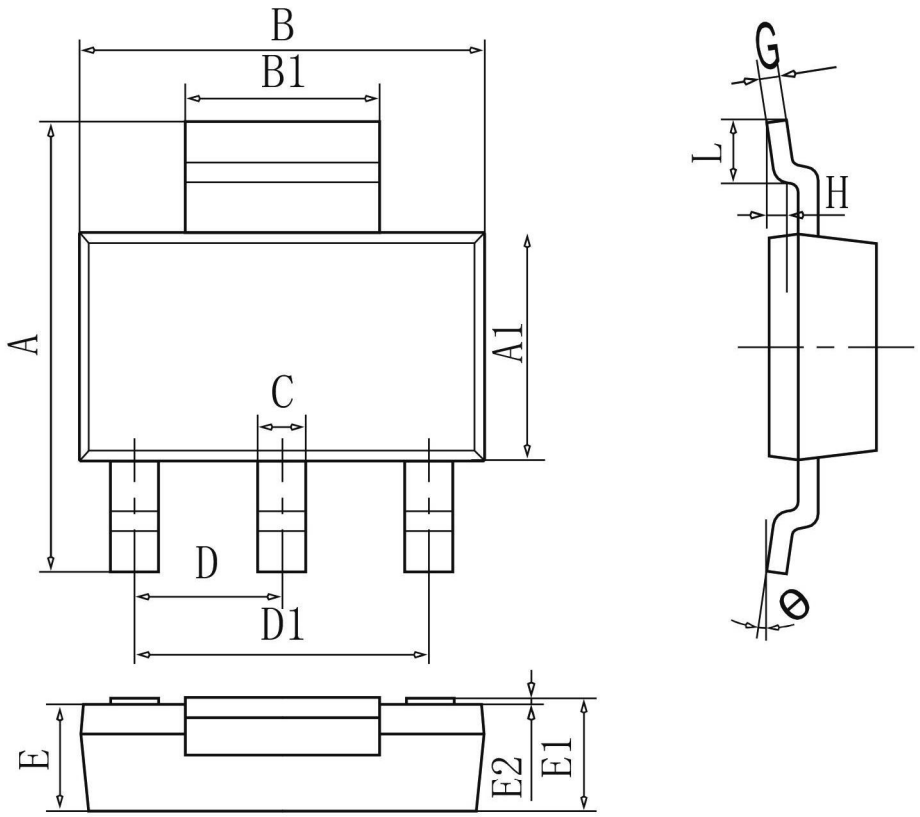


Figure 10. Normalized Maximum Transient Thermal Impedance



SOT-223 Package Information



DIM	MIN	NOM	MAX
A	6.80	7.00	7.20
A1	3.30	3.50	3.70
B	6.40	6.60	6.80
B1	2.96	3.00	3.10
C	0.66	0.70	0.80
D	2.25	2.30	2.35
D1	4.60REF		
E	1.50	1.60	1.70
E1	1.65REF		
E2	0.02	0.06	0.10
G	0.255	0.305	0.355
H	0.25GAUGR		
L	0.90	–	–
θ	0°	–	10°
All Dimensions in mm			