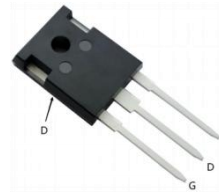


Features

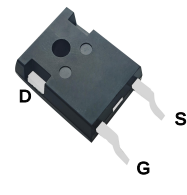
- Fast Intrinsic Diode
- Gate charge minimized
- Very low intrinsic capacitances
- High speed switching

Applications

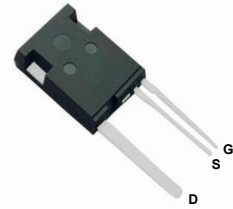
- High Voltage Power Supplies
- Capacitor Discharge Applications
- Pulse circuits
- Laser and X-Ray Generation Systems



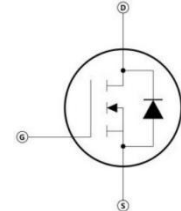
HGC0



HGC8



HGC9



Electrical ratings

Absolute maximum ratings			
Parameter	Symbol	Value	Unit
Drain-source voltage ($V_{GS} = 0$)	V_{DSS}	4500	V
Transient Gate- source voltage	V_{GSM}	± 30	
Continuous Gate- source voltage(DC)	V_{GSS}	± 20	
Drain current (continuous) at $T_C = 25\text{ }^{\circ}\text{C}$	I_D	1	A
Drain current (continuous) at $T_C = 100\text{ }^{\circ}\text{C}$		0.5	
Drain current (pulsed)	I_{DM}	3	
Total dissipation at $T_C = 25\text{ }^{\circ}\text{C}$	P_D	463	W
Avalanche Current	I_{AR}	0.6	A
Single pulse avalanche energy (starting $T_J = 25\text{ }^{\circ}\text{C}$, $I_D = I_{AR}$, $V_{DD} = 50\text{ V}$, $L=20\text{mH}$)	E_{AS}	3.6	mJ
Operating junction temperature	T_J	-55 ~ 150	$^{\circ}\text{C}$
Storage temperature	T_{stg}		
Maximum lead temperature for soldering purpose	T_L	300	$^{\circ}\text{C}$
Mounting Torque	M_d	1.13	N • m

Electrical Characteristics ($T_{vj} = 25^{\circ}\text{C}$ unless otherwise specified)

On /off states						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D = 250\text{ }\mu\text{A}$, $V_{GS} = 0$	4500			V
Zero gate voltage drain current ($V_{GS} = 0$)	I_{DSS}	$V_{DS} = \text{Max rating}$ $V_{DS} = \text{Max rating}$, $T_C = 125\text{ }^{\circ}\text{C}$			100 1000	μA

Gate-body leakage current ($V_{DS} = 0$)	I_{GSS}	$V_{GS} = \pm 20 \text{ V}$			± 200	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	-	5.9	7.0	V
Static drain-source on resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D=1\text{A}$	-	19	30	Ω

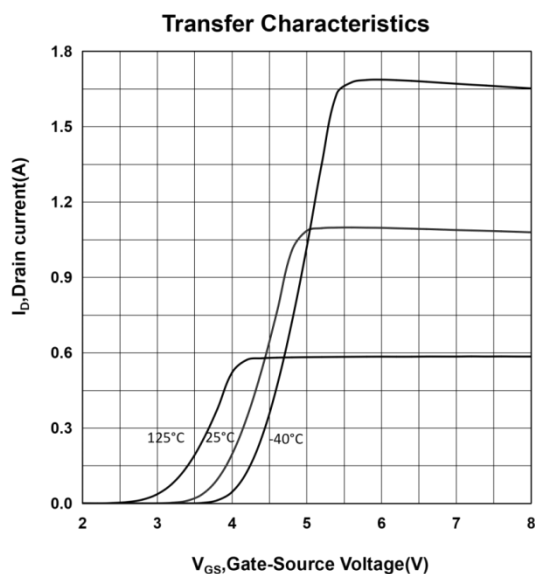
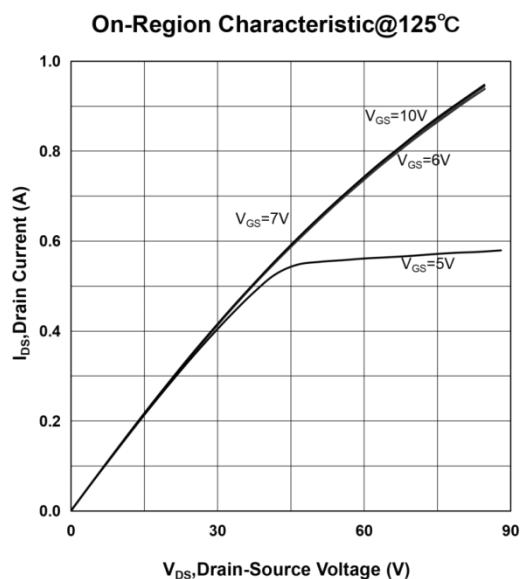
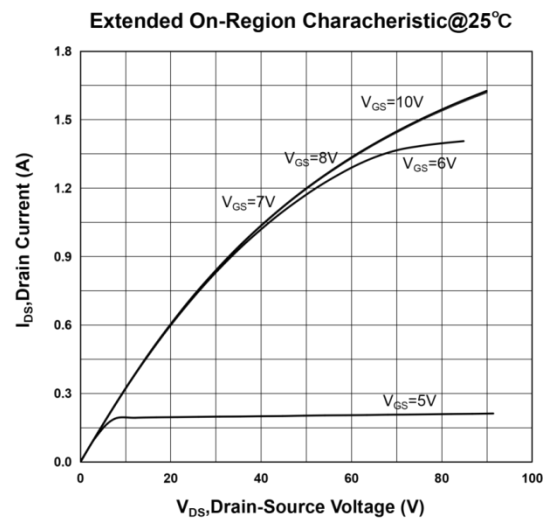
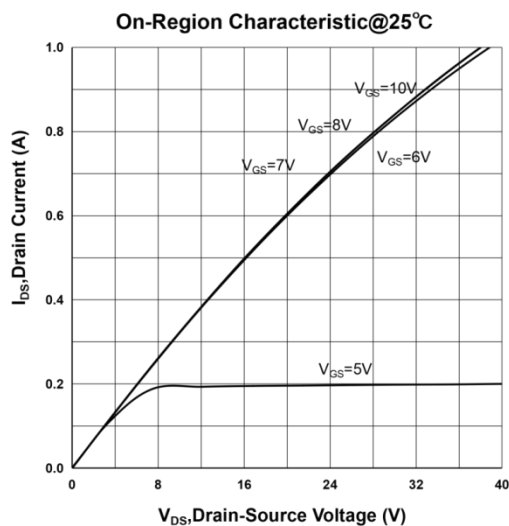
Dynamic						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Forward transconductance	g_{fs}	$V_{DS} = 10 \text{ V}, I_D=1\text{A}$		2.7		S
Input capacitance	C_{iss}	$V_{DS}=25\text{V}, f=1\text{MHz}, V_{GS}=0$		3540		pF
Output capacitance	C_{oss}			210		
Reverse transfer capacitance	C_{rss}			68		
Total gate charge	Q_g	$V_{DD}=2250\text{V}, I_D=1\text{A}$ $V_{GS}=10\text{V}$		94		nC
Gate-source charge	Q_{gs}			14		
Gate-drain charge	Q_{gd}			50		
Switching times						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Turn-on delay time	$t_{d(on)}$	Resistive load $V_{DD} = 2250\text{V}, I_D = 1\text{A},$ $V_{GS} = 10 \text{ V},$ $R_G = 5\Omega(\text{External})$		19		ns
Rise time	t_r			23		
Turn-off-delay time	$t_{d(off)}$			52		
Fall time	t_f			53		
Source drain diode						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Source-drain current	I_{SD}				4	A
Source-drain current (pulsed)	I_{SDM}				12	
Forward on voltage	V_{SD}	$I_{SD}= 1\text{A}, V_{GS}= 0$		0.84	1.5	V
Reverse recovery time	t_{rr}	$I_{SD}= 1\text{A}, -di/dt= 100\text{A}/\mu\text{s}$ $V_{DD}= 2250\text{V}$		620		ns
Reverse recovery charge	Q_{rr}			570		nC
Reverse recovery current	I_{RRM}			1.1		A
Reverse recovery time	t_{rr}	$I_{SD}= 1\text{A}, di/dt= 100\text{A}/\mu\text{s}$ $V_{DD}= 2250 \text{ V } T_J=125^\circ\text{C}$		880		ns
Reverse recovery charge	Q_{rr}			460		nC

Reverse recovery current	I_{RRM}		1.3	A
Thermal data				
Parameter	Symbol	Value	Unit	
Thermal resistance junction-case max	$R_{thj-case}$	0.27	°C/W	
Thermal resistance junction-ambient max	$R_{thj-amb}$	50		

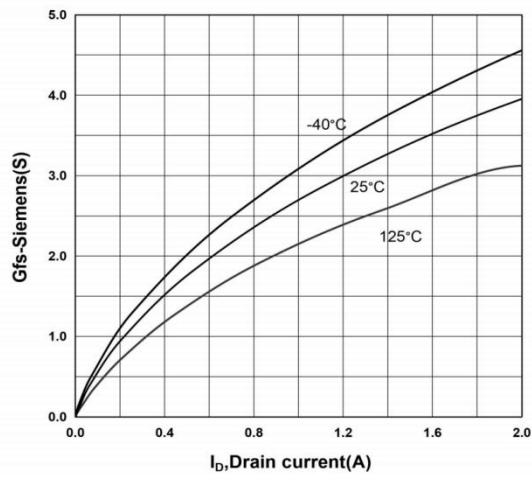
Order Information

Order Code	marking	packaging
MS1N450HGC0	MS1N450HGC0	Tube
MS1N450HGC8	MS1N450HGC8	Tube
MS1N450HGC9	MS1N450HGC9	Tube

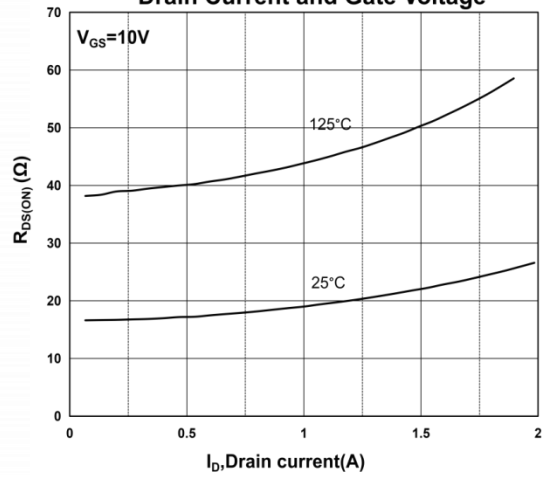
Electrical characteristics



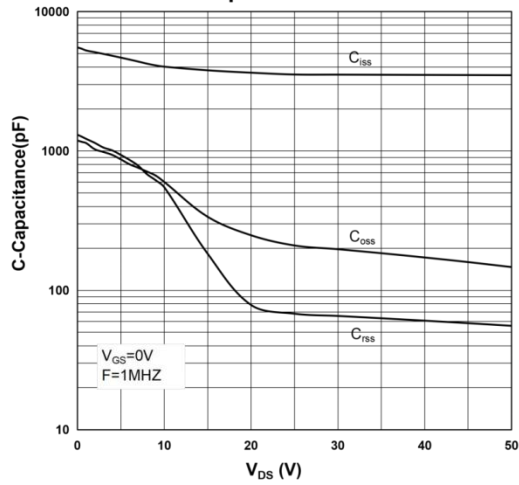
Transconductance



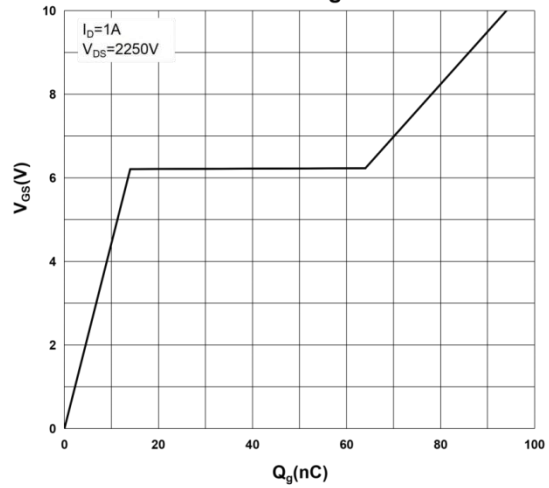
On-Resistance Variation vs Drain Current and Gate Voltage



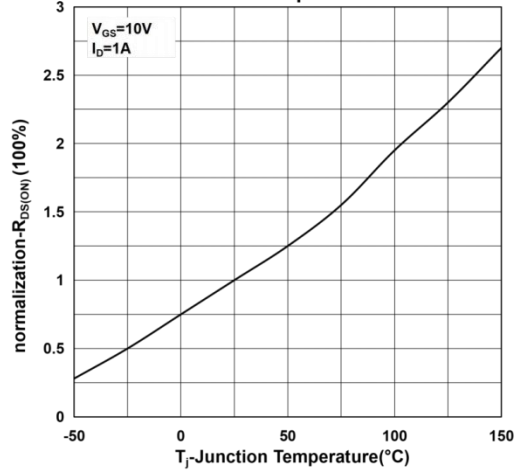
Capacitance



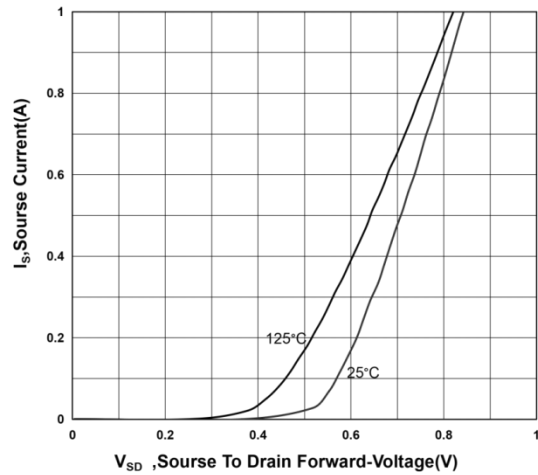
Gate Charge



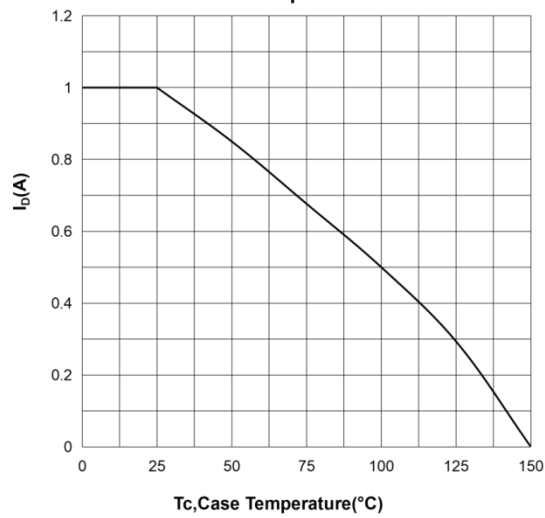
Normalization On-Resistance Variation vs Junction Temperature



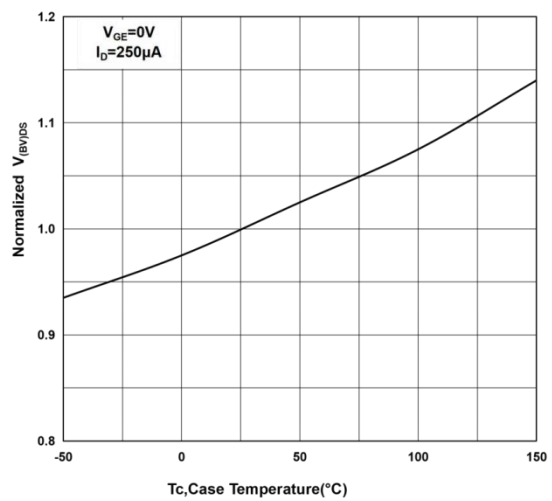
Body Diode Forward Voltage Variation with Source Current and Temperature



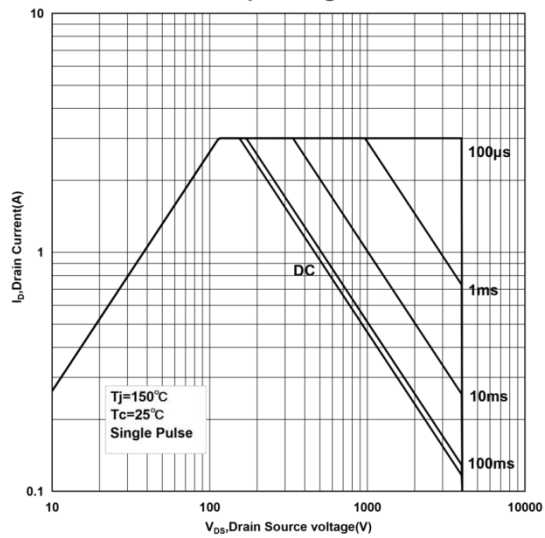
Maximum Drain Current vs Case Temperature



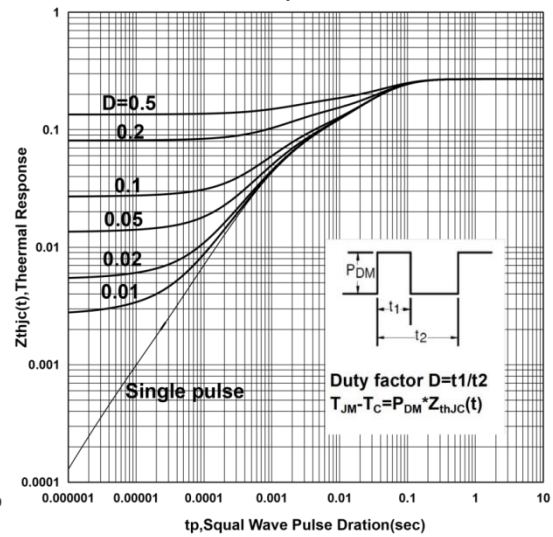
Normalized $V_{(BV)DS}$ vs temperature



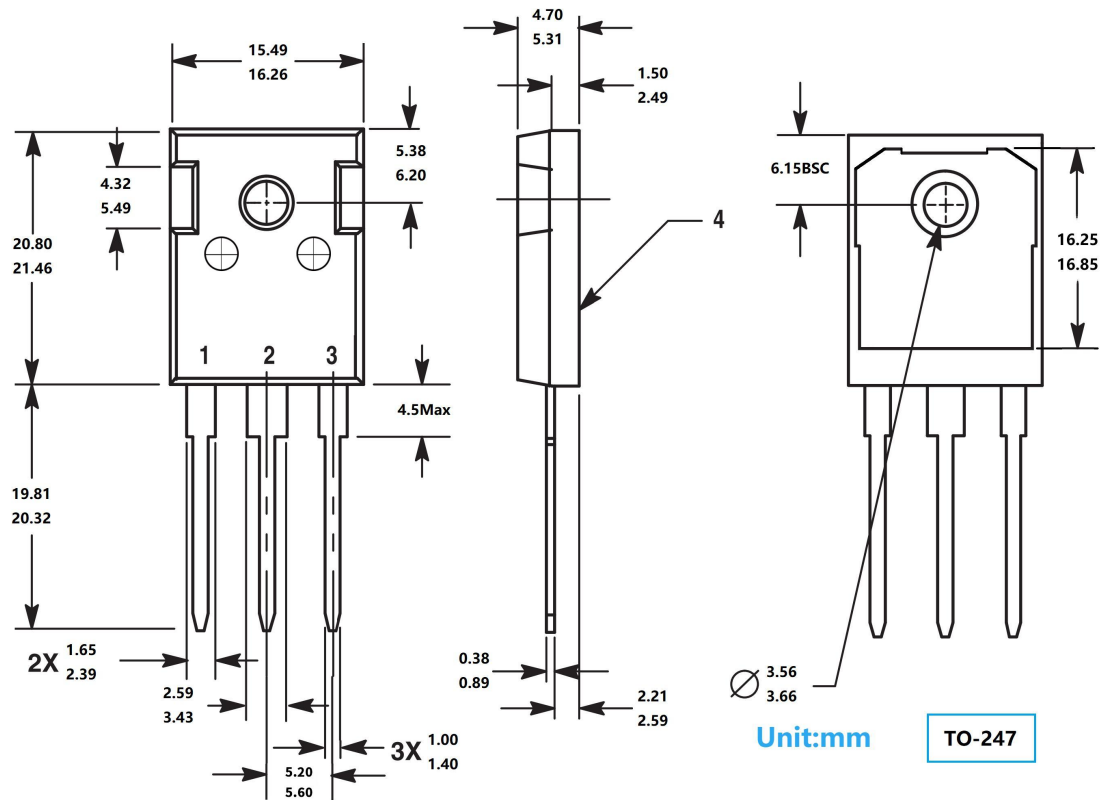
Safe Operating Area



Transient response Curve

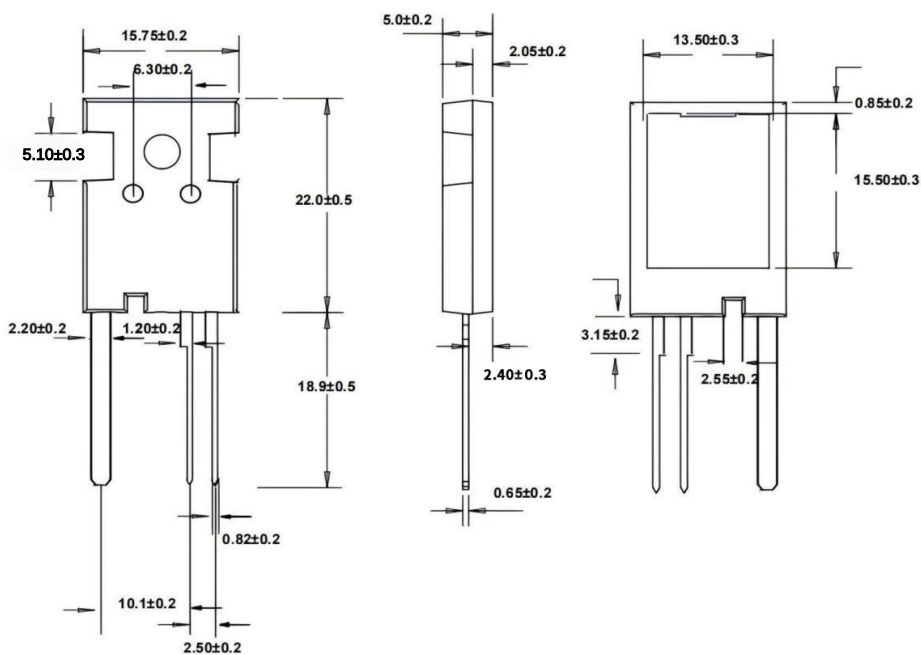


Package outline dimension (Unit:mm)



Package outline dimension (Unit:mm)

TO-247-C9



TO-247-C8

