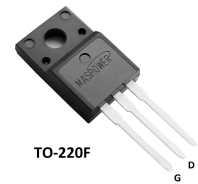


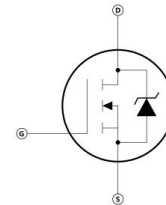
Features

- $V_{DSS}=800V, I_D=9A@25^{\circ}C$
- 100% avalanche tested
- Very low intrinsic capacitances ($Q_g=39nC$ Typ.)
- High speed switching
- Very low on-resistance



Applications

- Power factor correction
- Switching applications
- Uninterruptible power supply



Absolute maximum ratings

Parameter	Symbol	Value	Unit
Drain-source voltage ($V_{GS} = 0$)	V_{DSS}	800	V
Transient Gate- source voltage	V_{GSM}	± 30	
Continuous Gate- source voltage	V_{GSS}	± 20	
Drain current (continuous) at $T_C = 25^{\circ}C$	I_D	9	A
Drain current (continuous) at $T_C = 100^{\circ}C$		4.5	
Drain current (pulsed)(note 1)	I_{DM}	36	
Avalanche current, repetitive or not-repetitive (note 1)	I_{AR}	9	A
Single pulse avalanche energy (note 2)	E_{AS}	432	mJ
Peak diode recovery dv/dt (note 3)	dv/dt	4.5	V/ns
Total dissipation at $T_C = 25^{\circ}C$	P_{TOT}	54	W
Total dissipation at $T_C = 100^{\circ}C$	P_{TOT}	21	W
Operating junction temperature range	T_J	-55 to 150	$^{\circ}C$
Storage temperature range	T_{stg}		
Maximum lead temperature for soldering purpose	T_L	260	$^{\circ}C$

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

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
On /off states						
Drain-source	$V_{(BR)DSS}$	$I_D = 0.25mA, V_{GS} = 0$	800			V

breakdown voltage						
Zero gate voltage drain current ($V_{GS} = 0$)	I_{DSS}	$V_{DS} = 800V$ $V_{DS}=640, T_C=125\text{ }^{\circ}C$		- -	1 100	μA
Gate-body leakage current ($V_{DS} = 0$)	I_{GSS}	$V_{GS} = \pm 20\text{ V}, V_{DS}=0V$			± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu A$	2.5	3.6	4.5	V
Static drain-source on resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 2A$		1.3	1.6	Ω
Dynamic						
Forward transconductance	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 4A$		8.6		S
Input capacitance	C_{iss}	$V_{DS}=100V, f=1MHz,$ $V_{GS}=0V$		1340		pF
Output capacitance	C_{oss}			130		
Reverse transfer capacitance	C_{rss}			20		
Gate input resistance	R_g	$f=1MHz$,open drain		6		Ω
Total gate charge	Q_g	$V_{DD}=640V, I_D=9A$ $V_{GS}=10V$		39		nC
Gate-source charge	Q_{gs}			8		
Gate-drain charge	Q_{gd}			21		
Switching times						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 400\text{ V}, I_D = 9\text{ A},$ $R_G = 12\text{ }\Omega, V_{GS} = 10\text{ V}$		43		ns
Rise time	t_r			101		
Turn-off-delay time	$t_{d(off)}$			52		
Fall time	t_f			71		
Source drain diode						
Source-drain current	I_{SD}				9	A
Source-drain current (pulsed)	I_{SDM}				36	
Forward on voltage	V_{SD}	$I_{SD}= 1A, V_{GS}= 0$		0.72	1.4	V
Reverse recovery time	t_{rr}	$I_{SD}= 9A, di/dt= 100A/\mu s$ $V_{DD}= 50\text{ V}$		600		ns
Reverse recovery charge	Q_{rr}			3.6		μC
Reverse recovery current	I_{RRM}			5.4		A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance junction-case,max	$R_{thj-case}$	2.3	$^{\circ}C/W$
Thermal resistance junction-ambient,max	$R_{thj-amb}$	62	

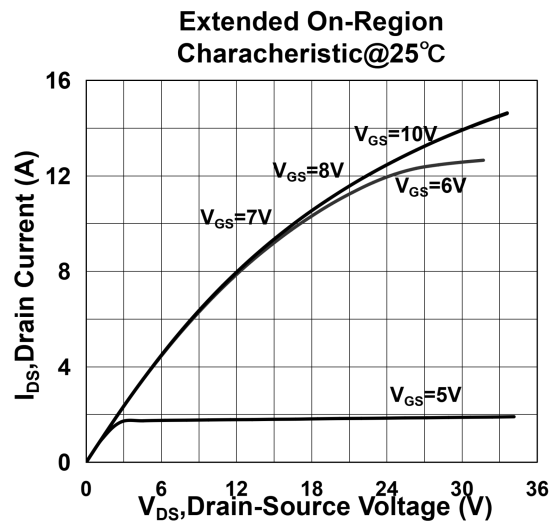
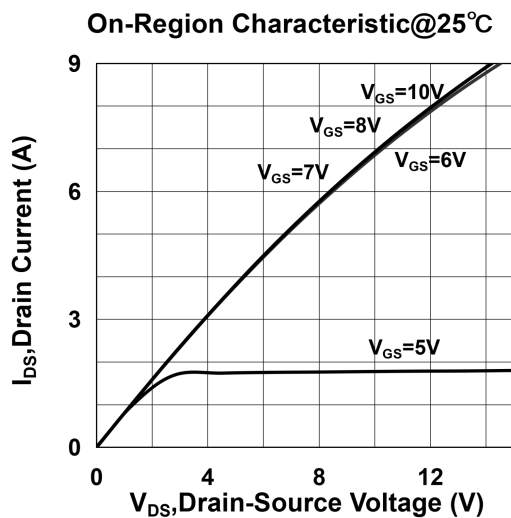
Notes:

1. Pulse width limited by maximum junction temperature
2. $L = 10mH, I_{AS} = 9A, V_{DD} = 50V, R_G = 25\Omega$, Starting $T_J = 25^{\circ}C$
3. $I_{SD} \leq 9A, di/dt \leq 200A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^{\circ}C$
4. Pulse Test : Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
5. Essentially independent of operating temperature

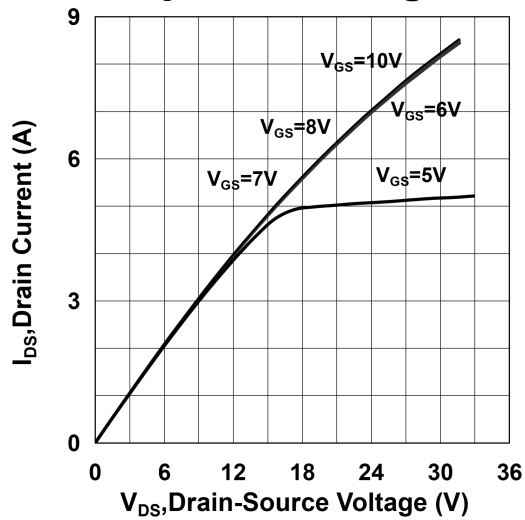
Ordering Information

Ordering code	Silkscreen	Package
MS9N80HGT1	MS9N80HGT1	TO-220F

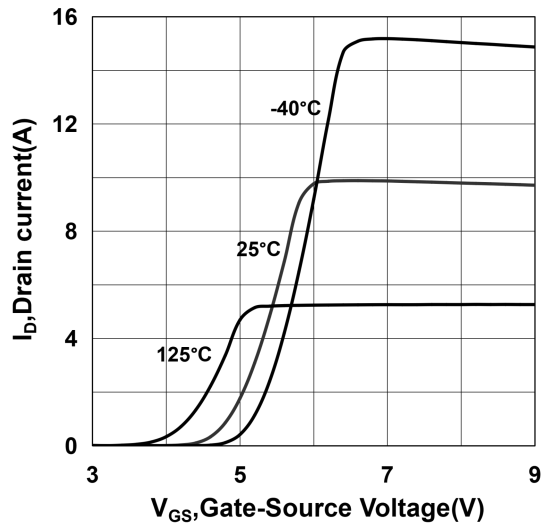
Electrical characteristics



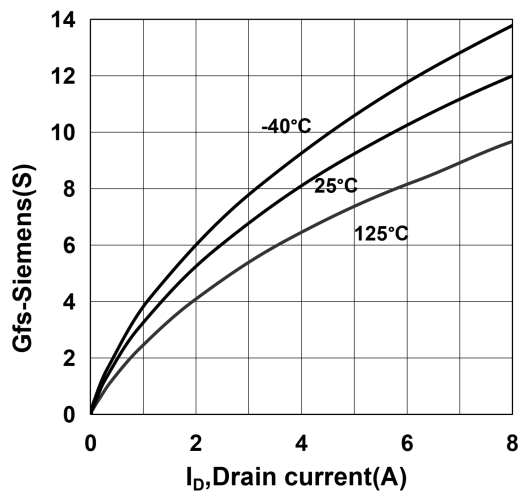
On-Region Characteristic@125°C



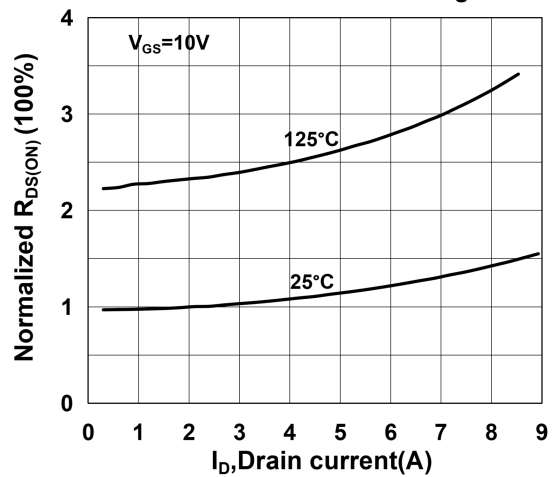
Transfer Characteristics



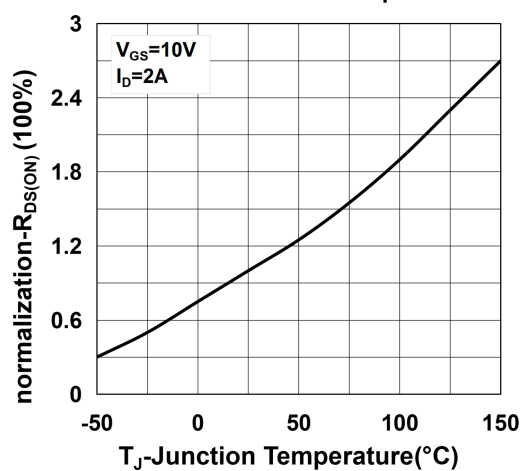
Transconductance



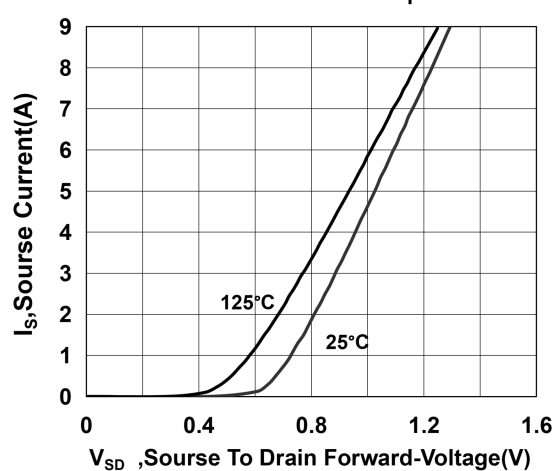
Normalized On-Resistance Variation vs Drain Current and Gate Voltage

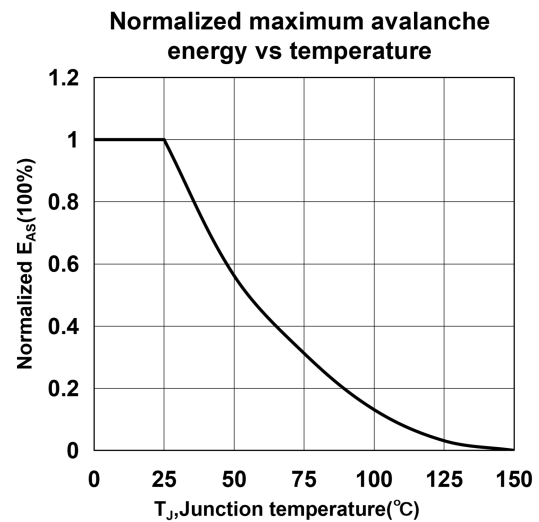
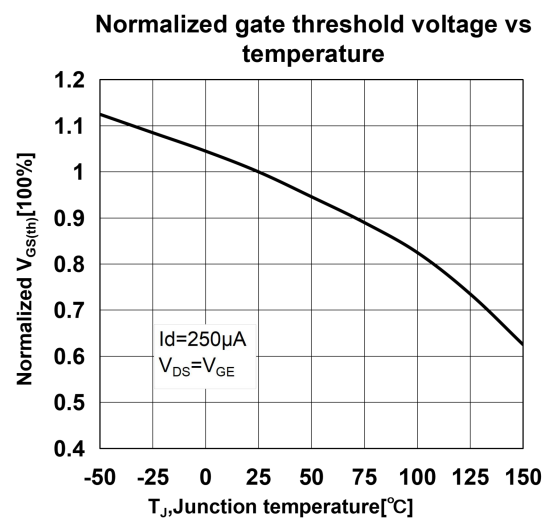
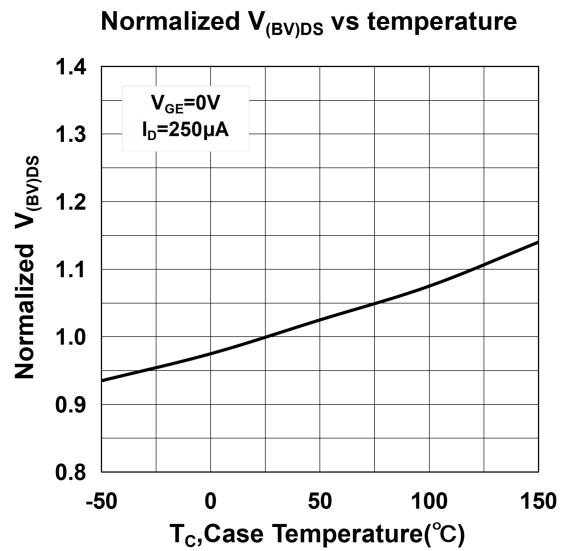
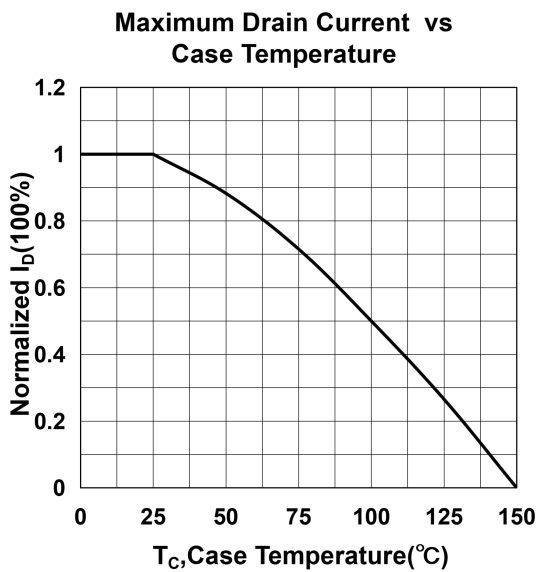
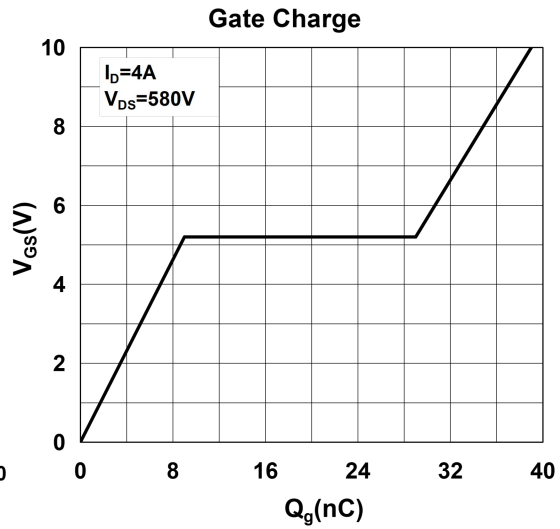
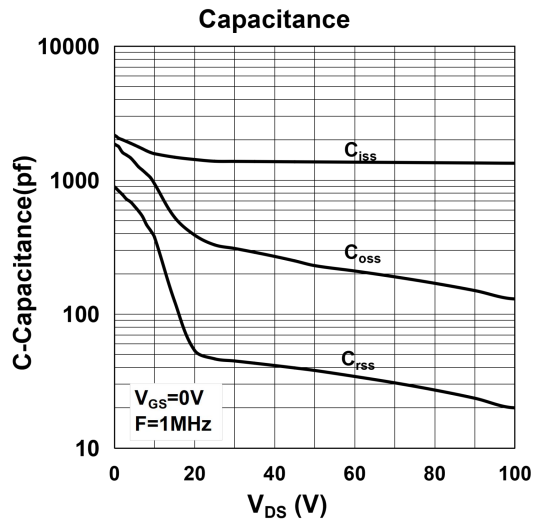


Normalization On-Resistance Variation vs Junction Temperature

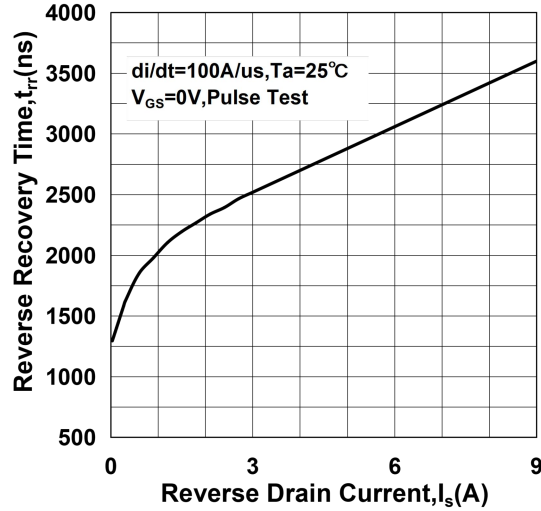


Body Diode Forward Voltage Variation with Source Current and Temperature

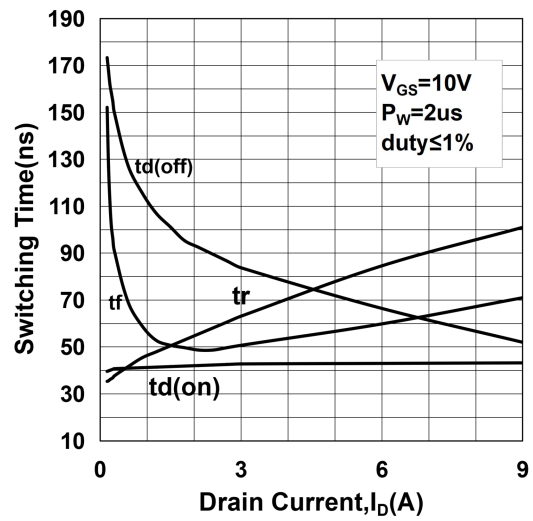




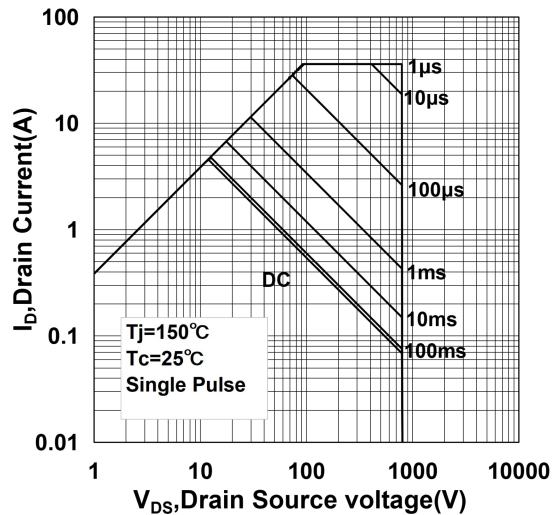
Body Diode Reverse Recovery Time vs Source to Drain Current



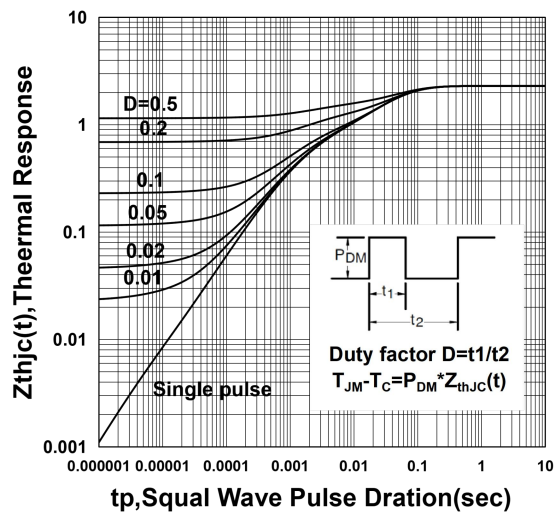
Switching Characteristics



Safe Operating Area



Transient response Curve



Package outline dimension

