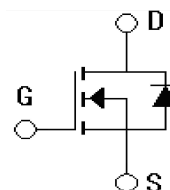
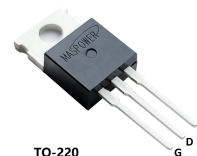
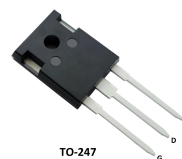


Features

- Low gate charge
- Low $R_{DS(on)}$ (typical 4.3 m Ω)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS Compliant



Applications

- High power DC/DC converters and switch mode power supplies
- Automotive applications
- DC motor control
- UPS

Absolute Ratings ($T_C=25^{\circ}\text{C}$)

Parameter	Symbol		Value	Unit
Drain-Source Voltage	V _{DSS}		100	V
Transient Gate-Source Voltage	V _{GSM}		±30	V
Continuous Gate-Source Voltage	V _{GSS}		±20	V
Drain Current -continuous	I _D	T=25℃	180	A
		T=100℃	120	A
Drain Current - pulse （note 1）	I _{DM}		720	A
Single Pulsed Avalanche Energy （note 2）	E _{AS}		1440	mJ
Avalanche Current （note 1）	I _{AR}		120	A
Repetitive Avalanche Current （note 1）	E _{AR}		50	mJ
Peak Diode Recovery dv/dt （note 3）	dv/dt		16	V/ns
Power Dissipation	P _D	T _C =25℃	208	W
		T _C =100℃	83	W
Operating and Storage Temperature Range	T _J ,T _{STG}		-55~+150	℃
Maximum Lead Temperature for Soldering Purposes	T _L		300	℃

*Drain current limited by maximum junction temperature

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

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
Off-Characteristics						
Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	100	-	-	V
Drain cut-off current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$ $T_j=25^{\circ}C$	-	-	1	μA
		$V_{DS}=100V, T_j=125^{\circ}C$	-	-	10	
Gate-body leakage current, forward	I_{GSSF}	$V_{DS}=0V, V_{GS}=20V$	-	-	100	nA
Gate-body leakage current, reverse	I_{GSSR}	$V_{DS}=0V, V_{GS}=-20V$	-	-	-100	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	-	4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=40A$ (note 3)	-	4.3	5.6	m Ω
Forward Transconductance	g_{fs}	$V_{DS}=40V, I_D=50A$ (note 3)	-	100	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$	-	8300	-	pF
Output capacitance	C_{oss}		-	950	-	pF
Reverse transfer capacitance	C_{rss}		-	15	-	pF

Switching Characteristics						
Turn-On delay time	td(on)	V _{DD} =40V, I _D =20A, R _G =3.0Ω, V _{GS} =10V(note 4)	-	24	-	ns
Turn-On rise time	t _r		-	50	-	ns
Turn-Off delay time	T _{d(off)}		-	66	-	ns
Turn-Off Fall time	t _f		-	30.6	-	ns
Total Gate Charge	Q _g	V _{DS} =50V, I _D =50A, V _{GS} =10V(note4,5)	-	105	-	nC
Gate-Source charge	Q _{gs}		-	46	-	nC
Gate-Drain charge	Q _{gd}		-	10	-	nC
Drain-Source Diode Characteristics						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =50A (note 3)	-	0.9	1.3	V
Continuous Drain-Source	I _S		-	-	180	A

Diode Forward Current					
Pulsed Drain-Source Diode Forward Current	I_{SM}		-	-	720 A
Reverse recovery time	t_{rr}	$V_{GS}=0V, I_F=50A$ $di_F/dt=100A/\mu s$ (note 4)	-	78	- ns
Reverse recovery charge	Q_{rr}		-	190	- nC

Thermal Characteristic

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.6	$^{\circ}C/W$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	$^{\circ}C/W$

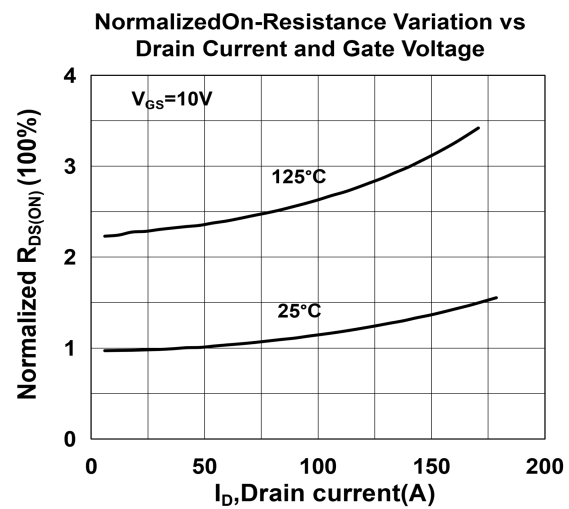
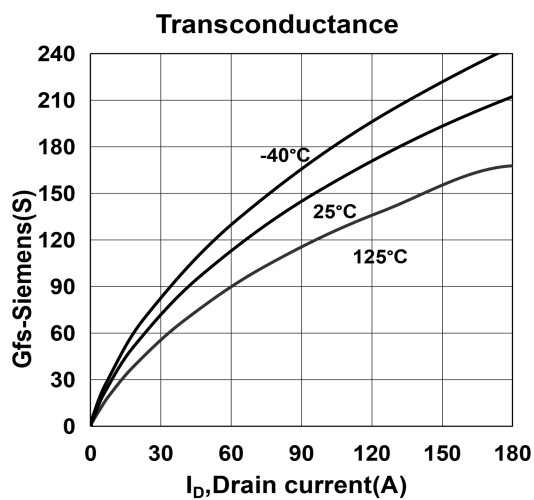
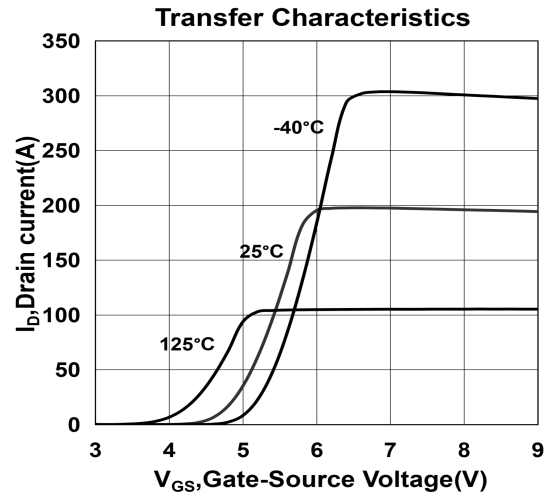
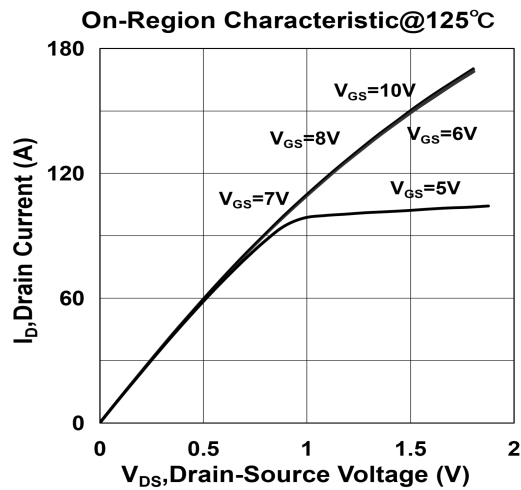
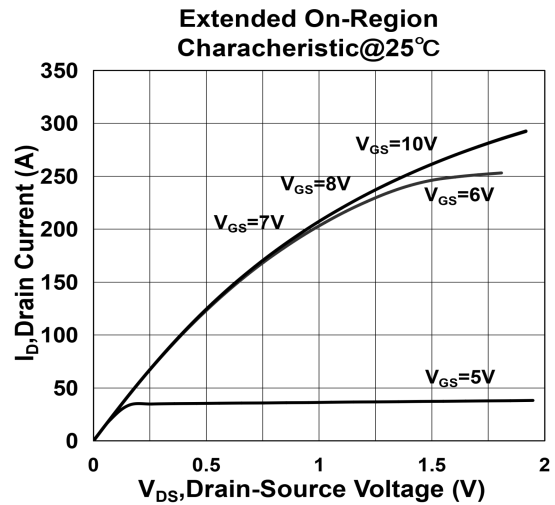
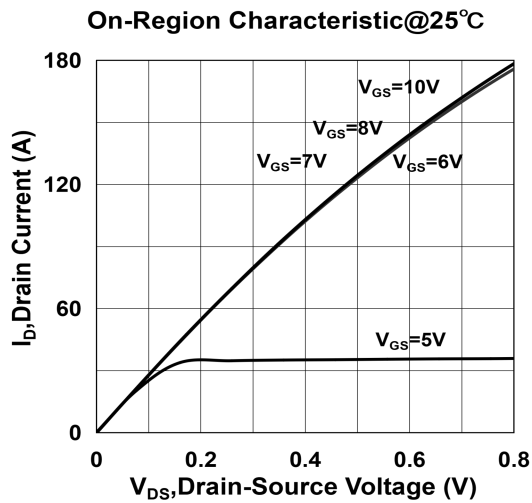
Notes:

- 1: Pulse width limited by maximum junction temperature
- 2: $L=0.1mH$, $I_{AS}=120A$, $V_{DD}=50V$, $R_G=25\ \Omega$, Starting $T_J=25^{\circ}C$
- 3: $I_{SD} \leq 180A$, $di/dt \leq 200A/\mu s$, $V_{DD} \leq BV_{DSS}$, 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

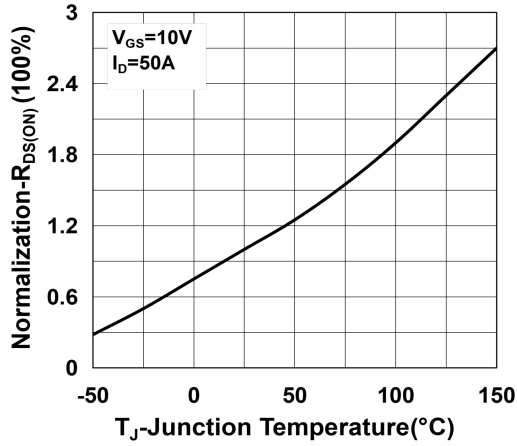
Order information

Order codes	Package	Packaging
MS180N10FC	TO-247	Tube
MS180N10FT	TO-220	Tube

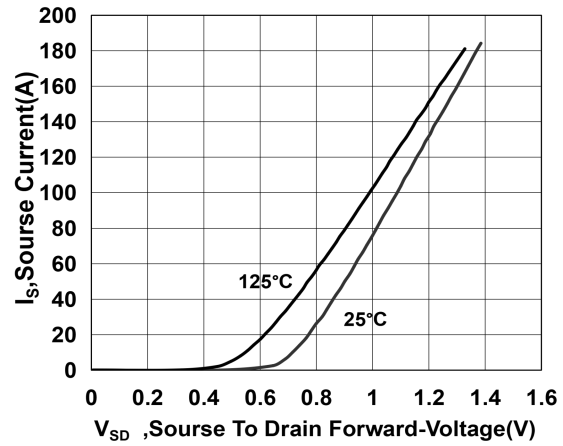
Electrical Characteristics



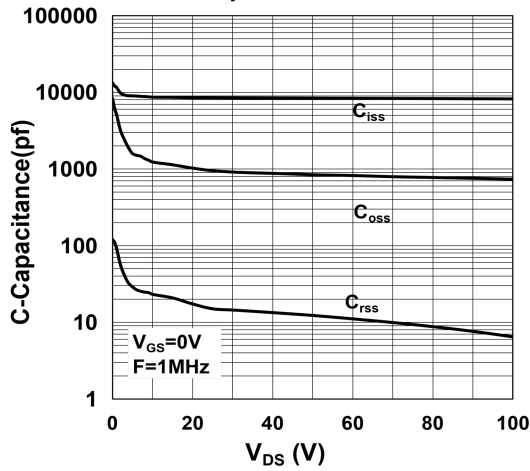
**Normalization On-Resistance
Variation vs Junction Temperature**



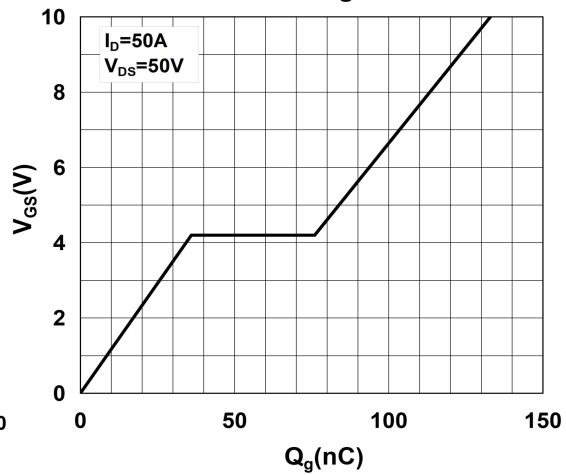
**Body Diode Forward Voltage Variation
with Source Current and Temperature**



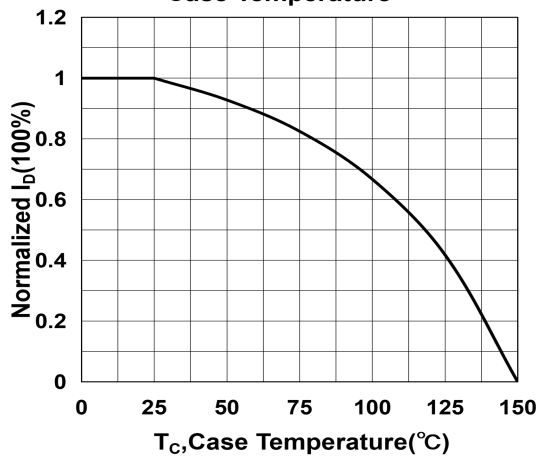
Capacitance



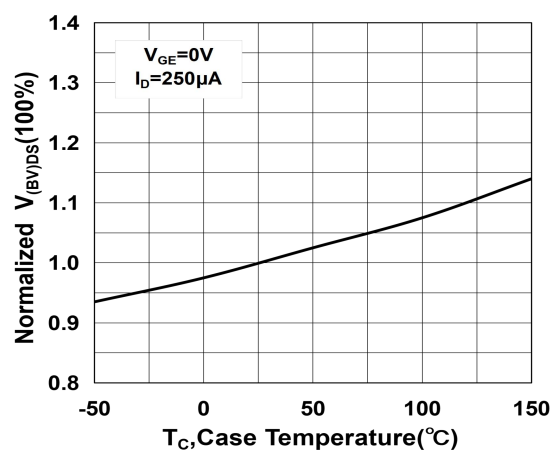
Gate Charge



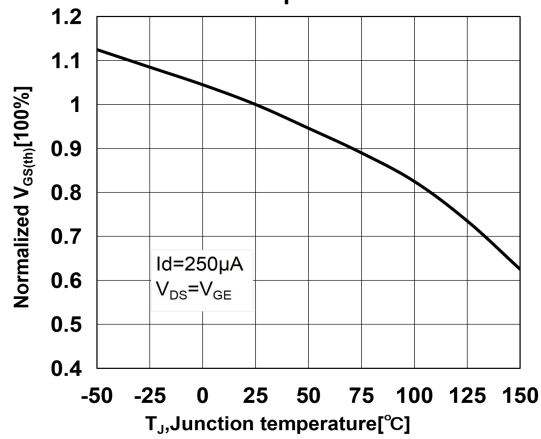
**Maximum Drain Current vs
Case Temperature**



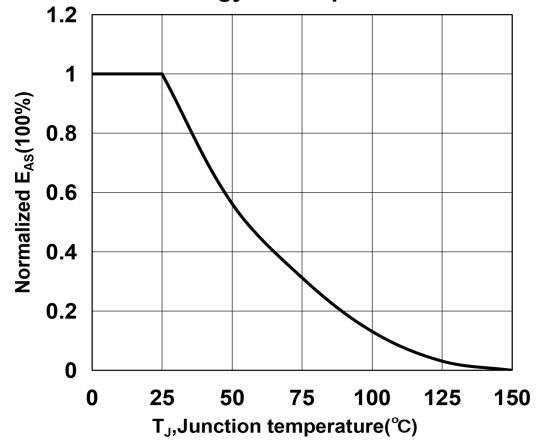
Normalized $V_{(BV)DS}$ vs temperature



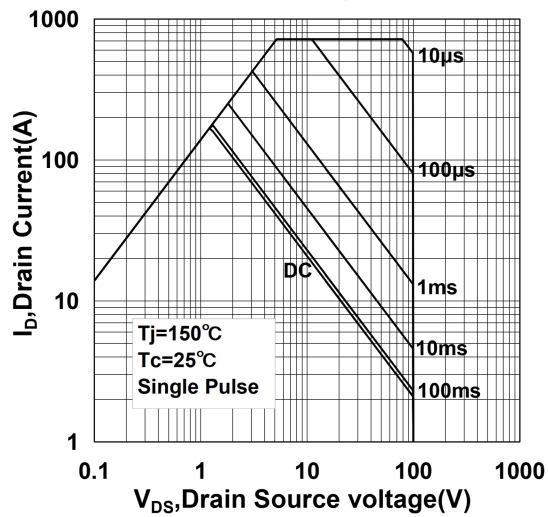
Normalized gate threshold voltage vs temperature



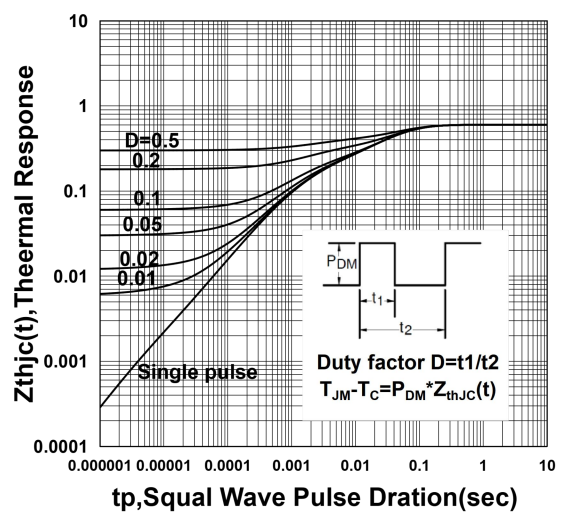
Normalized maximum avalanche energy vs temperature



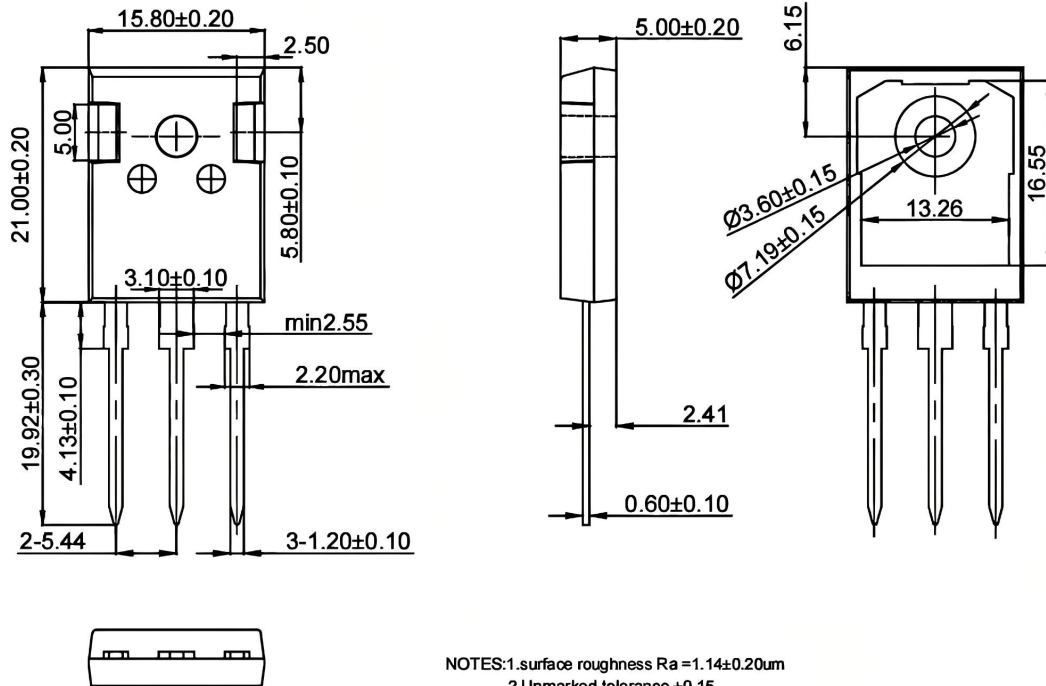
Safe Operating Area

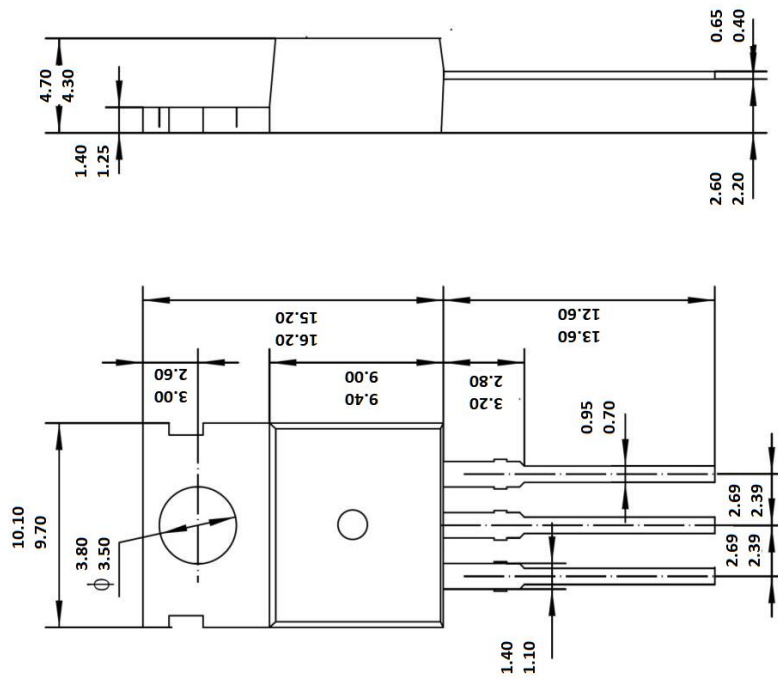


Transient response Curve



Package Mechanical DATA





Unit: mm

TO-220

