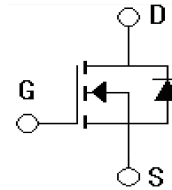
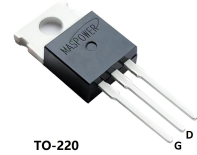
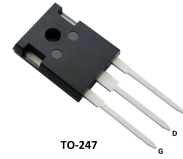


Features

- Low gate charge
- Low $R_{DS(on)}$ (typical 3.6 mΩ)
- 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_{DS}	100	V
Drain Current -continuous	$I_D, T=25^\circ\text{C}$ $T=100^\circ\text{C}$	180	A
		120	A
Drain Current - pulse (note 1)	I_{DM}	480	A
Gate-Source Voltage	V_{GS}	± 20	V
Single Pulsed Avalanche Energy (note 2)	E_{AS}	1000	mJ
Avalanche Current (note 1)	I_{AR}	120	A
Repetitive Avalanche Current (note 1)	E_{AR}	500	mJ
Peak Diode Recovery dv/dt (note 3)	dv/dt	16	V/ns
Power Dissipation	PD $T_C=25^\circ\text{C}$ -Derate above 25°C	250	W
		1.67	W/ $^\circ\text{C}$
Operating and Storage Temperature Range	T_j, T_{STG}	-55~+175	$^\circ\text{C}$
Maximum Lead Temperature for Soldering Purposes	T_L	300	$^\circ\text{C}$

*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	$R_{DS(ON)}$	$V_{GS}=10V, I_D=50A$ (note 3)	-	3.6	4.5	m Ω
Forward Transconductance	g_{fs}	$V_{DS}=40V, I_D=20A$ (note 3)	-	30	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$	-	6600	-	pF
Output capacitance	C_{oss}		-	600	-	pF
Reverse transfer capacitance	C_{rss}		-	320	-	pF

Switching Characteristics						
Turn-On delay time	td(on)	VDD=40V,ID=50A, RG=25Ω, VGS=10V(note 4,5)	-	104	-	ns
Turn-On rise time	t _r		-	186	-	ns
Turn-Off delay time	T _{d(off)}		-	343	-	ns
Turn-Off Fall time	t _f		-	181	-	ns
Total Gate Charge	Qg	V _{DS} =50V, I _D =50A, V _{GS} =10V(note4,5)	-	133	-	nC
Gate-Source charge	Qgs		-	36	-	nC
Gate-Drain charge	Qgd		-	40	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V _{SD}	VGS=0V,IS=40A (note 3)	-	-	1.2	V
Maximum Continuous Drain-Source	I _s		-	-	180	A

Diode Forward Current					
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}		-	-	520 A
Reverse recovery time	trr	VGS=0V, IF=100A dIF/dt=100A/us(note 3)	-	49	- ns
Reverse recovery charge	Qrr		-	91	- uC

Thermal Characteristic

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

Notes:

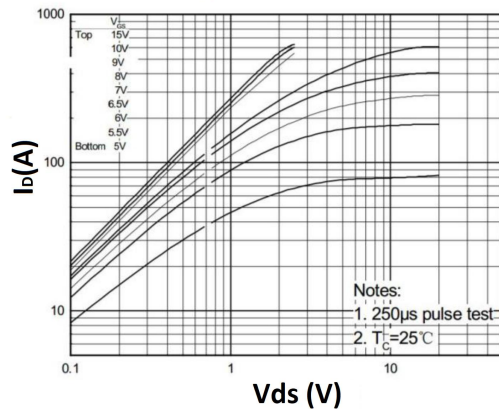
- 1: Pulse width limited by maximum junction temperature
- 2: L=0.5mH, $I_{AS}=56A$, $V_{DD}=64V$, $R_G=25\ \Omega$, Starting $T_J=25^\circ C$
- 3: $I_{SD} \leq 120A$, $di/dt \leq 200A/\mu s$, $V_{DD} \leq BV_{DSS}$, Starting $T_J=25^\circ C$
- 4: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 5: Essentially independent of operating temperature

Order information

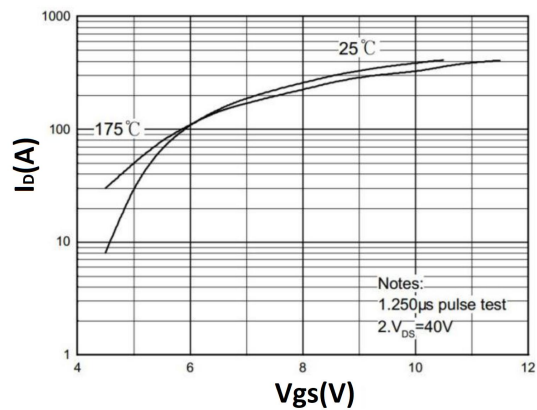
Order codes	Package	Packaging
MS180N10FC	TO-247	Tube
MS180N10FT	TO-220	Tube

Electrical Characteristics

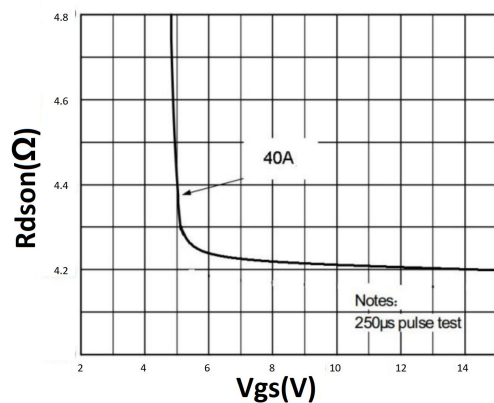
On-Region Characteristics



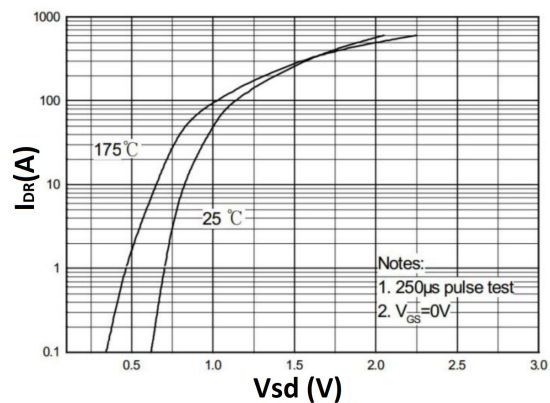
Transfer Characteristics



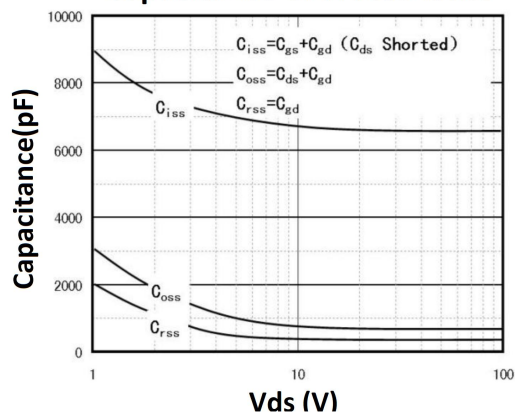
On-Resistance Variation vs. Drain Current and Gate Voltage



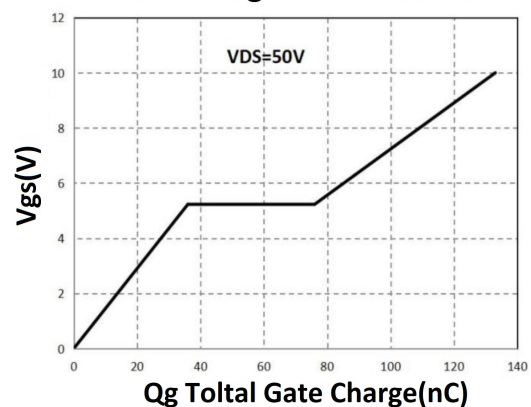
Body Diode Forward Voltage Variation vs. Source Current and Temperature



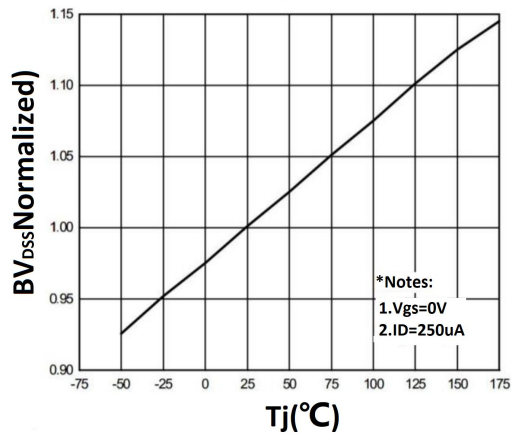
Capacitance Characteristics



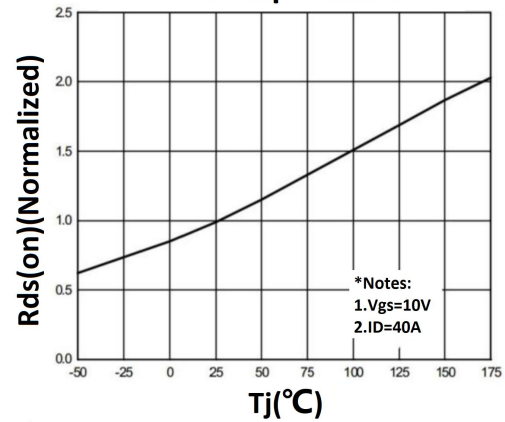
Gate Charge Characteristics



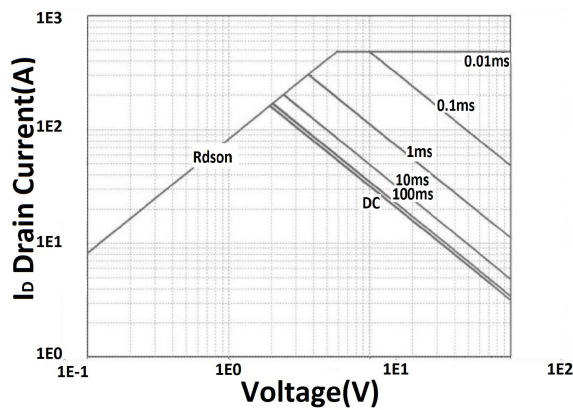
Breakdown Voltage Variation vs. Temperature



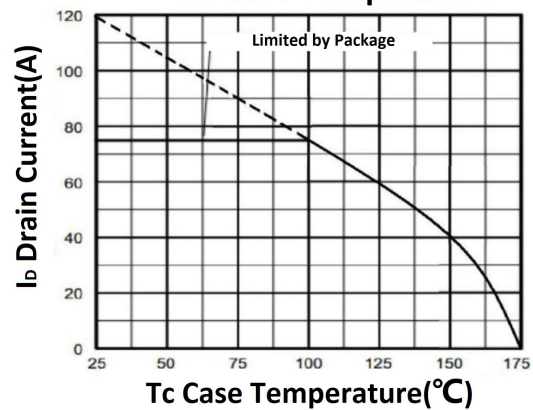
On-Resistance Variation vs. Temperature



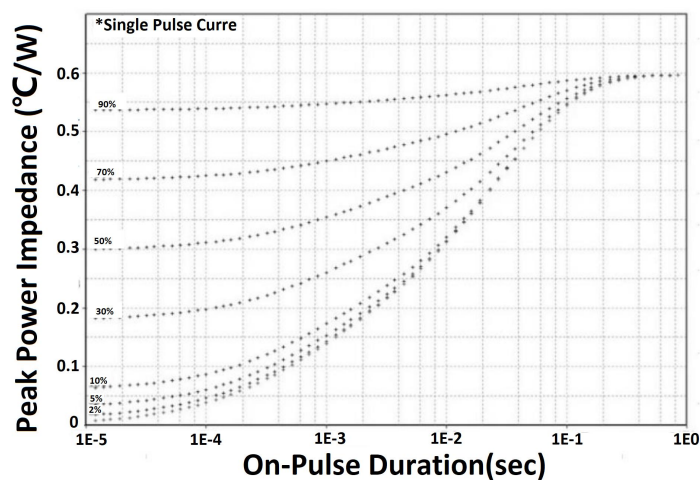
Maximum Safe Operating Area



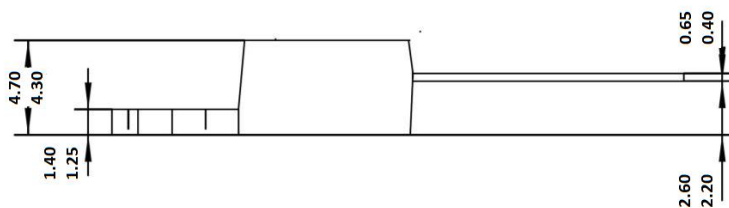
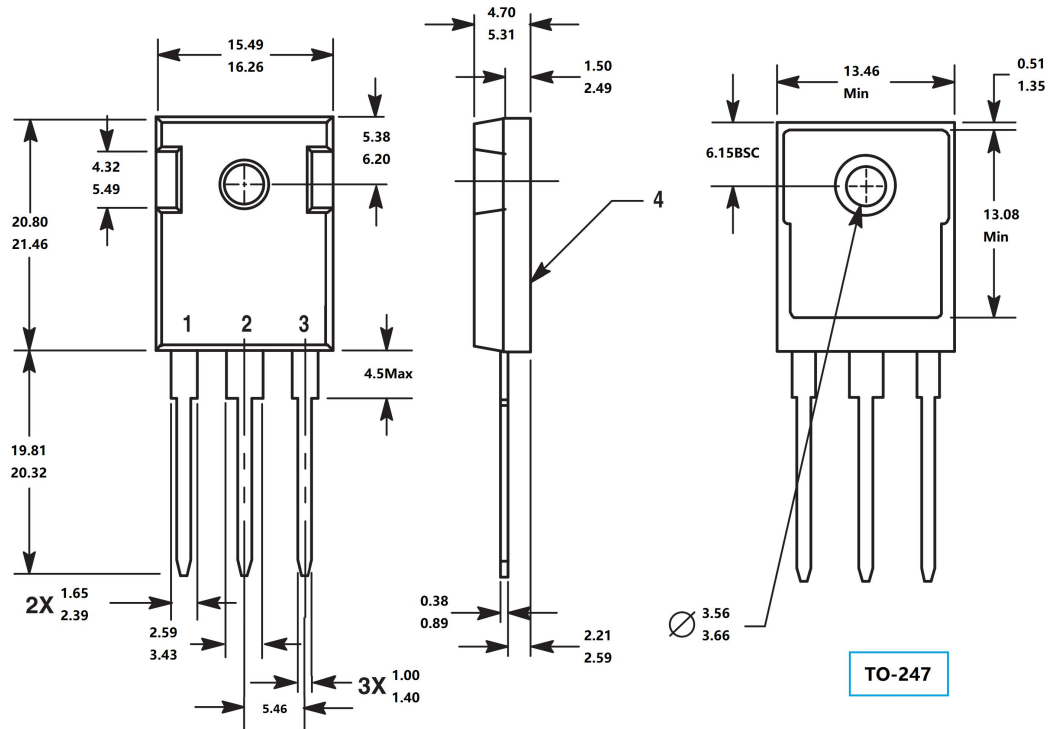
Maximum Drain Current vs. Case Temperature



Transient Thermal Response Curve



Package Mechanical DATA



Unit: mm

TO-220

