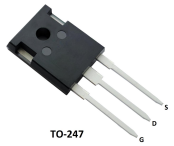
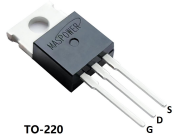
Features

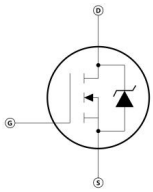
- 100% avalanche tested
- Avalanche ruggedness
- Very low intrinsic capacitances
- High speed switching
- Very low on-resistance





Applications

- Welder
- UPS
- PV Inverter
- Switching applications



Electrical ratings

Absolute maximum ratings			
Parameter	**Symbol**	**Value**	**Unit**
Drain-source voltage (V_{GS} = 0)	V_{DS}	1200	V
Gate- source voltage	V_{GS}	± 30	
Drain current (continuous) at T_C = 25 °C	I_D	8	A
Drain current (continuous) at T_c = 100 °C		5.5	
Drain current (pulsed)	I_{DM}	22	
Total dissipation at T_C = 25 °C（TO-247）	P_{TOT}	260	W
Derating factor		2.56	W/℃
Operating junction temperature	T_J	-55 to 175	℃
Storage temperature	T_{stg}		

Thermal data				
Parameter	**Symbol**	**Value**		**Unit**
		TO-247	**TO-220**	
Thermal resistance junction-case max	$R_{thj\text{-}case}$	0.39	0.5	W/℃
Thermal resistance junction-ambient max	$R_{thj\text{-}amb}$	50	62.5	
Maximum lead temperature for soldering purpose	T_J	300		

Avalanche characteristics			
Parameter	**Symbol**	**Max value**	**Unit**
Avalanche current, repetitive or not-repetitive (pulse width limited by T_J max)	I_{AR}	8	A
Single pulse avalanche energy (starting T_J = 25 °C, I_D = I_{AR}, V_{DD} = 50 V)	E_{AS}	760	mJ

Electrical Characteristics (Tvj = 25°C unless otherwise specified)

On /off states						
Parameter	**Symbol**	**Test conditions**	**Min**	**Typ**	**Max**	**Unit**
Drain-source breakdown voltage	$V_{(BR)DSS}$	I_D = 1 mA, V_{GS} = 0	1200	-	-	V
Zero gate voltage drain current (V_{GS} = 0)	I_{DSS}	V_{DS} = Max rating V_{DS}=Max rating, T_C=125 °C	-	-	66	μA
Gate-body leakage current (V_{DS} = 0)	I_{GSS}	V_{GS} = ± 30 V	-	-	± 100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	3	4	5	V
Static drain-source on resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 4A	-	2.3	3.5	Ω

Dynamic						
Parameter	**Symbol**	**Test conditions**	**Min**	**Typ**	**Max**	**Unit**
Forward transconductance	g_{fs}	V_{DS} = 15 V, I_D = 4	-	7.5	-	S
Input capacitance	C_{iss}	V_{DS}=25V,f=1MHz,V_{GS}=0	-	3310	-	pF
Output capacitance	C_{oss}		-	294	-	
Reverse transfer capacitance	C_{rss}		-	22.4	-	
Equivalent Output capacitance	$C_{oss\ eq.}$	V_{GS}=0,V_{DS}=0 to 1200V	-	118	-	
Gate input resistance	R_g	f=1MHz Gate DC Bias=0 Test signal level=20mV open drain	-	2.2	-	Ω
Total gate charge	Q_g	V_{DD}=1200V,I_D=8A V_{GS}=10V	-	89.3	-	nC
Gate-source charge	Q_{gs}		-	15.8	-	
Gate-drain charge	Q_{gd}		-	50.3	-	

Switching times						
Parameter	**Symbol**	**Test conditions**	**Min**	**Typ**	**Max**	**Unit**
Turn-on delay time	$t_{d(on)}$	V_{DD} = 750 V, I_D = 4 A, R_G = 4.7 Ω, V_{GS} = 10 V	-	41	-	ns
Rise time	t_r		-	14.7	-	
Turn-off-delay time	$t_{d(off)}$		-	86	-	
Fall time	t_f		-	31	-	

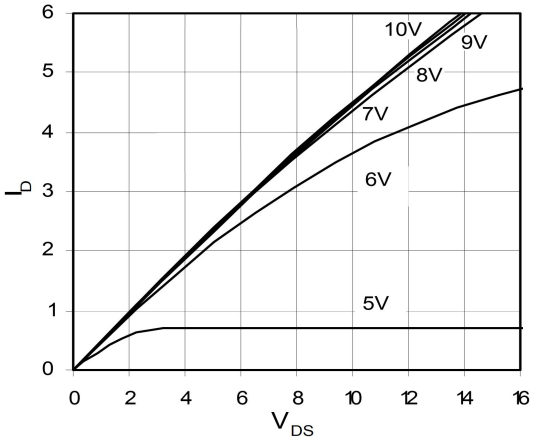
Source drain diode						
Parameter	**Symbol**	**Test conditions**	**Min**	**Typ**	**Max**	**Unit**
Source-drain current	I_{SD}		-	8	-	A
Source-drain current (pulsed)	I_{SDM}		-	22	-	
Forward on voltage	V_{SD}	I_{SD}= 6A, V_{GS}= 0	-	-	1.2	V
Reverse recovery time	t_{rr}	I_{SD}= 6A, di/dt= 100A/μs V_{DD}= 60 V	-	980	-	nS
Reverse recovery charge	Q_{rr}		-	9.5	-	μ C
Reverse recovery current	I_{RRM}		-	19.3	-	A
Reverse recovery time	t_{rr}	I_{SD}=6A, di/dt=100A/μs V_{DD}= 60V T_J=150°C	-	884	-	nS
Reverse recovery charge	Q_{rr}		-	8.2	-	μ C
Reverse recovery current	I_{RRM}		-	18.6	-	A

Order information

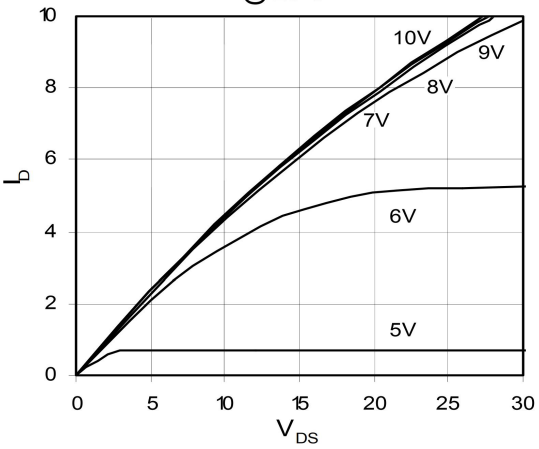
MS8N120FC	TO-247		
MS8N120FT	TO-220		

Electrical characteristics

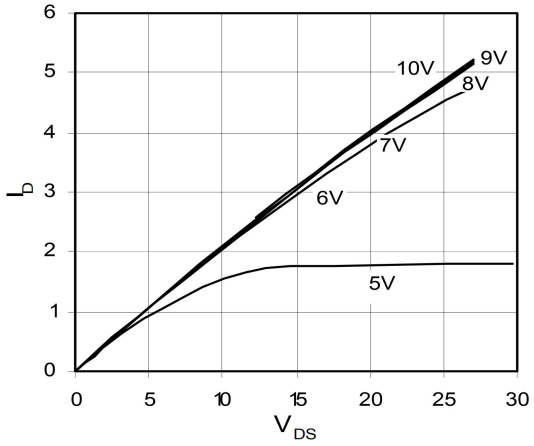
1. Output Characteristics @ 25˚C



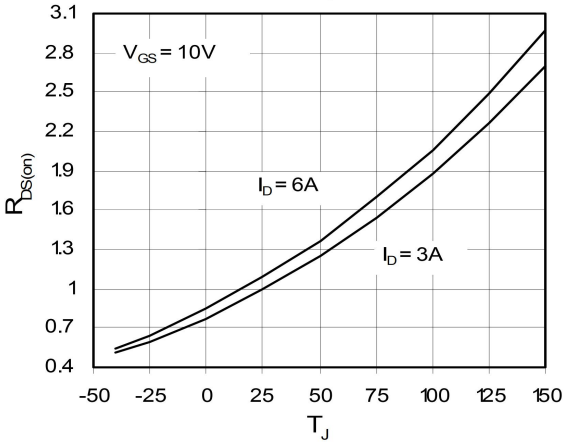
2. Extended Output Characteristics @ 25˚C



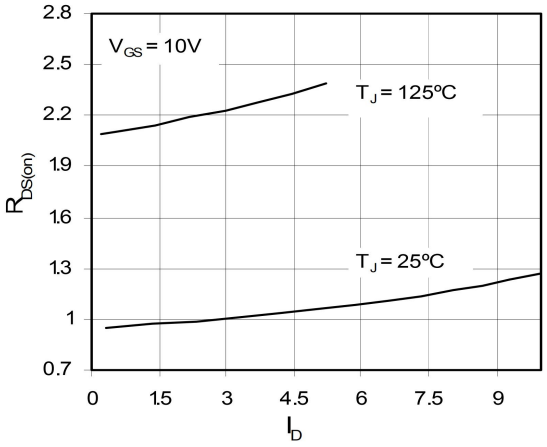
3. Output Characteristics @ 125˚C



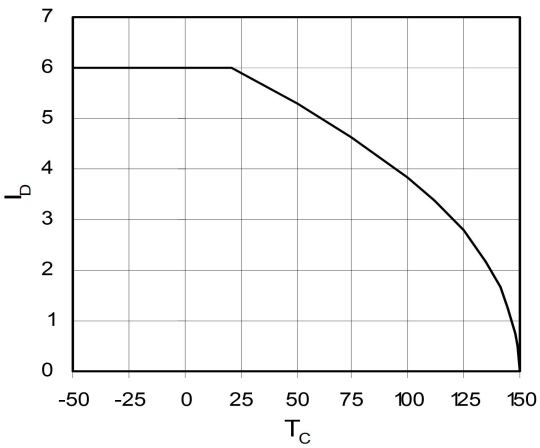
4. $R_{DS(on)}$ Normalized to I_D Value vs. Junction Temperature



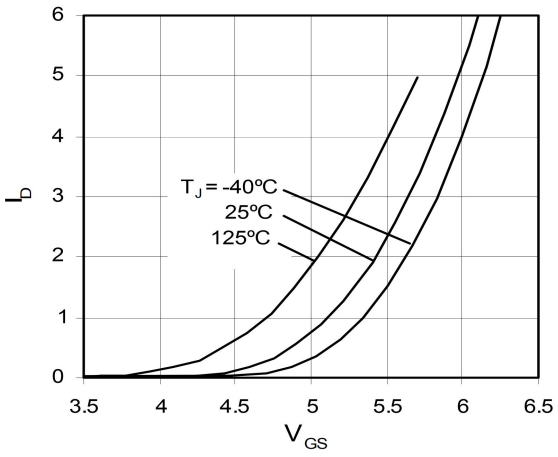
5. $R_{DS(on)}$ Normalized to I_D Value vs. I_D



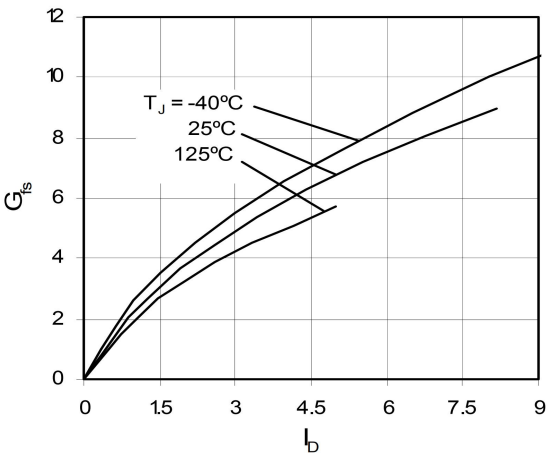
6. Drain Current vs. Case Temperature



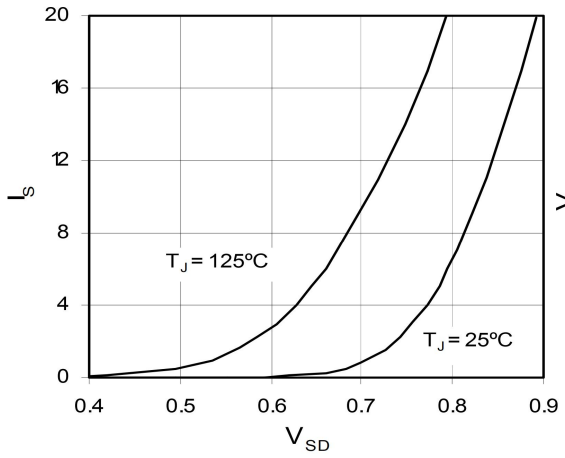
7. Input Admittance



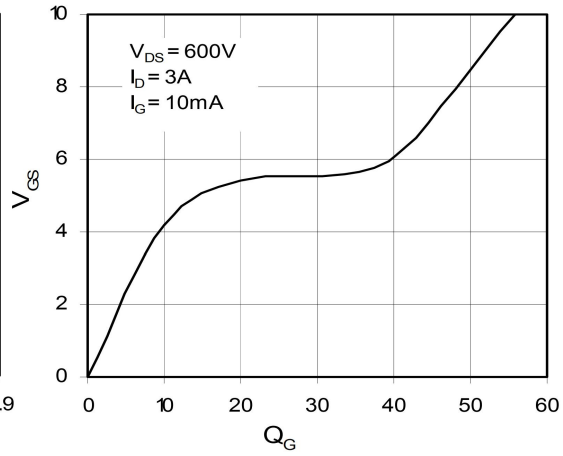
8. Transconductance



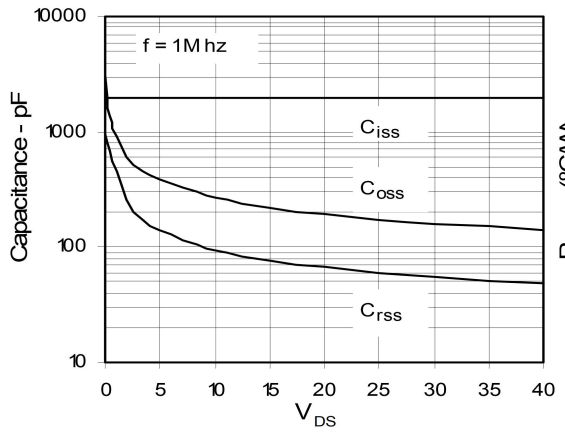
9. Source Current vs. Source-To-Drain



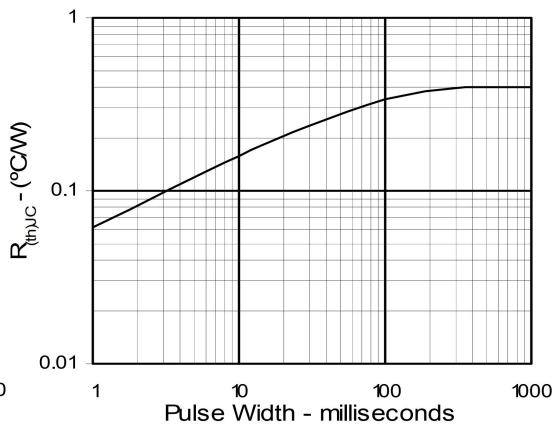
10. Gate Charge



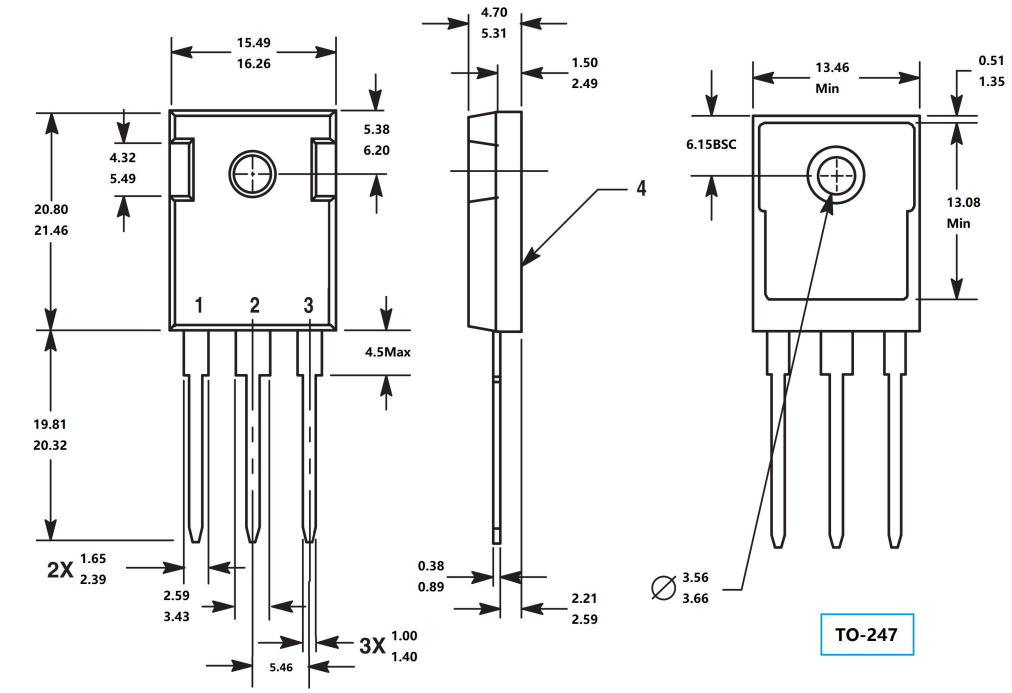
11. Capacitance

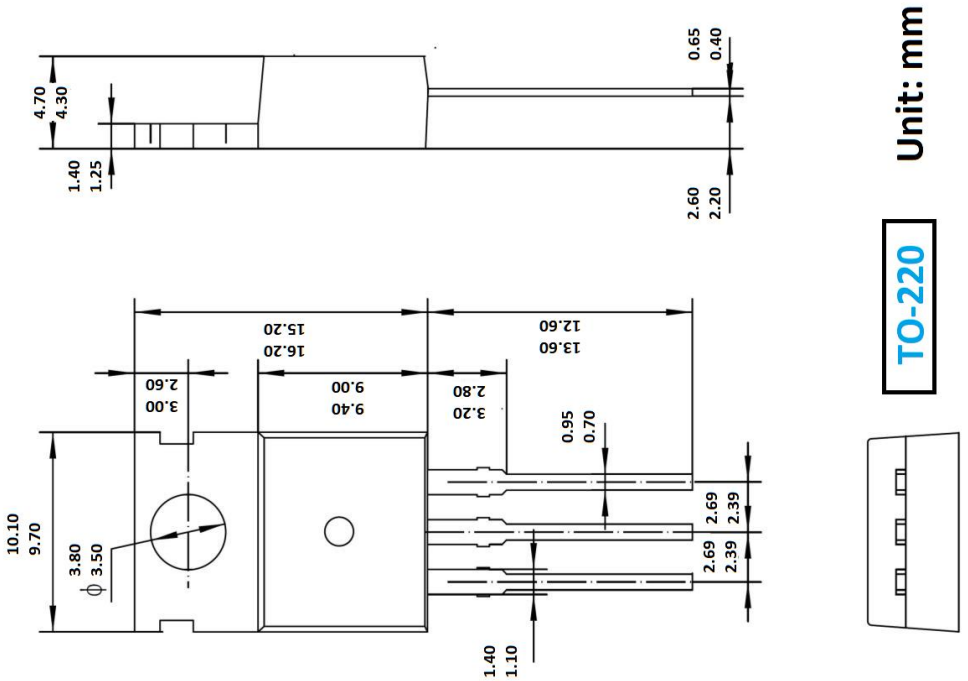


12. Maximum Transient Thermal Resistance



Package outline dimension





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