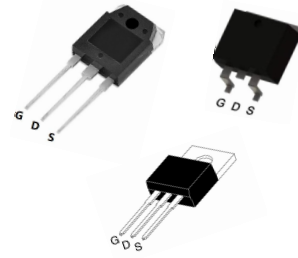


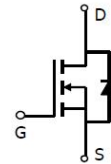
## Features

- $V_{DS}=150V$
- $I_D=120A @V_{GS}=10V$
- Very low on-resistance  $R_{DS(ON)}$   
 $<7.2m\Omega @V_{GS}=10V$



## Applications

Switching applications



## Absolute Maximum Ratings( $T_a=25^\circ C$ )

Characteristics		Symbol	Rating	Unit
Drain-source Voltage		$V_{DSS}$	150	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Continuous Drain Current <sup>(1)</sup>	$T_C=25^\circ C$ (Silicon Limited)	$I_D$	150	A
	$T_C=25^\circ C$ (Package Limited)		120	
	$T_C=100^\circ C$		90	
Pulsed Drain Current <sup>(3)</sup>		$I_{DM}$	460	
Power Dissipation	$T_C=25^\circ C$	$P_D$	312	W
	$T_C=100^\circ C$		125	
Single Pulse Avalanche Energy <sup>(2)</sup>		$E_{AS}$	520	mJ
Junction and Storage Temperature Range		$T_J, T_{stg}$	-55~150	$^\circ C$

## Thermal Characteristics

Characteristics	Symbol	Rating	Unit
Thermal Resistance, Junction-to-Ambient <sup>(1)</sup>	$R_{\theta JA}$	62.5	$^\circ C/W$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.4	

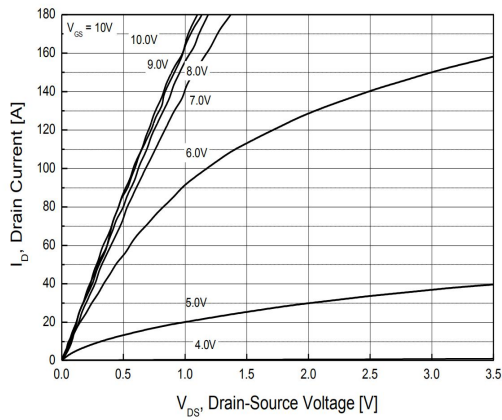
## Ordering Information

Part Number	Temp. Range	Package	Packing	RoHS
MS120N15FT	-55~150 $^\circ C$	TO-220	Tube	Free
MS120N15FE	-55~150 $^\circ C$	TO-263	Tube	Free
MS120N15FB	-55~150 $^\circ C$	TO-3PB	Tube	Free

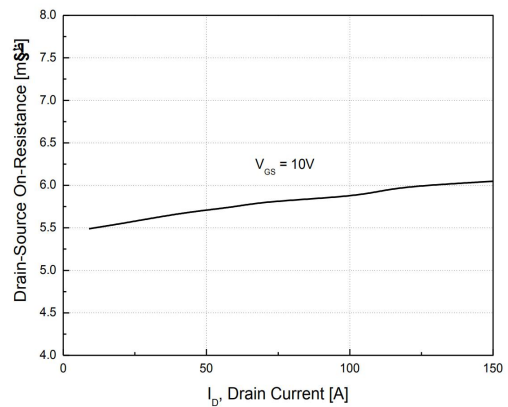
**Electrical Characteristics(T<sub>J</sub>=25°C)**

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =250uA, V <sub>GS</sub> =0V	150	-	-	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.8	-	3.9	
Drain Cut-Off Current	I <sub>DSS</sub>	V <sub>DS</sub> =120V, V <sub>GS</sub> =0V	-	-	1	uA
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±0.1	
Drain-Source ON Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =50A	-	5.8	7.2	mΩ
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =100A	-	68	-	S
<b>Dynamic Characteristics</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =50V, I <sub>D</sub> =50A, V <sub>GS</sub> =10V	-	89	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	32	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	22	-	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =40V, V <sub>GS</sub> =0V, f=1.0MHz	-	6,180	-	pF
Output Capacitance	C <sub>oss</sub>		-	2,130	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	96	-	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =50V, I <sub>D</sub> =50A, R <sub>G</sub> =3.0Ω	-	39	-	ns
Rise Time	t <sub>r</sub>		-	26	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	66	-	
Fall Time	t <sub>f</sub>		-	19	-	
Gate Resistance	R <sub>g</sub>	f=1MHz	-	3.3	-	Ω
<b>Drain-Source Body Diode Characteristics</b>						
Source-Drain Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =50A, V <sub>GS</sub> =0V	-	0.8	1.22	V
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =50A, di/dt=100A/us	-	160	-	ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>		-	627	-	nC

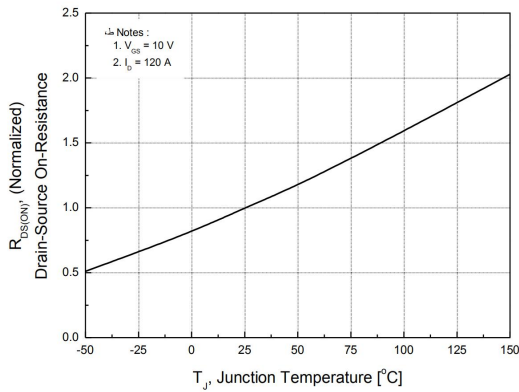
### Electrical characteristics(Curves)



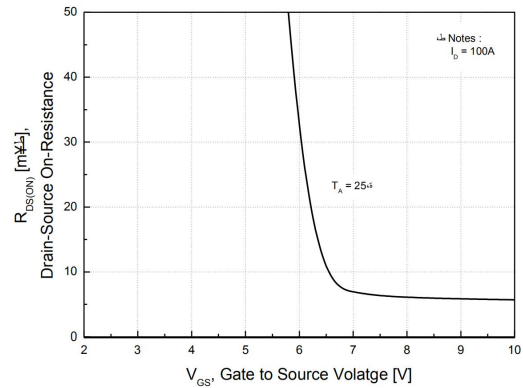
**Fig.1 On-Region Characteristics**



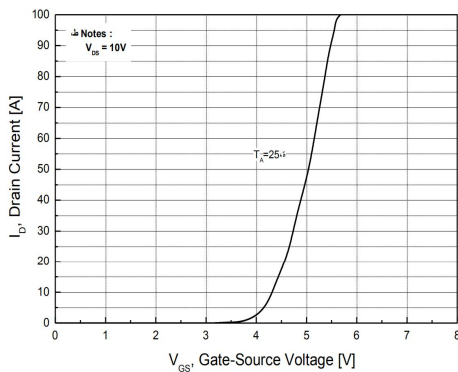
**Fig.2 On-Resistance Variation with Drain Current and Gate Voltage**



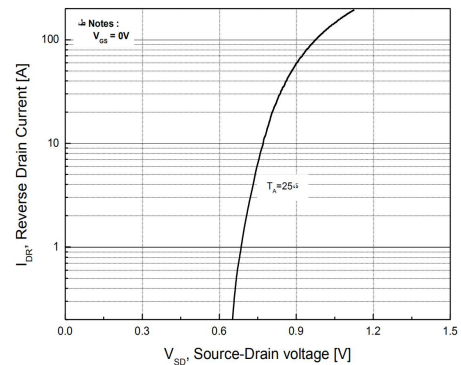
**Fig.3 On-Resistance Variation with Temperature**



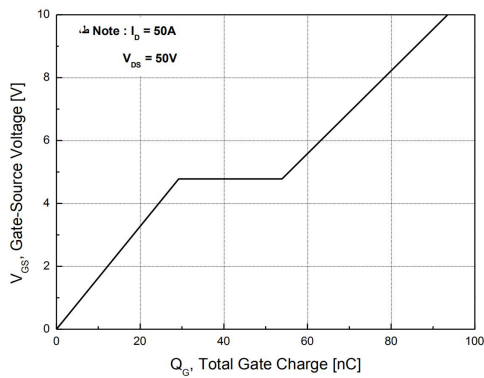
**Fig.4 On-Resistance Variation with Gate to Source Voltage**



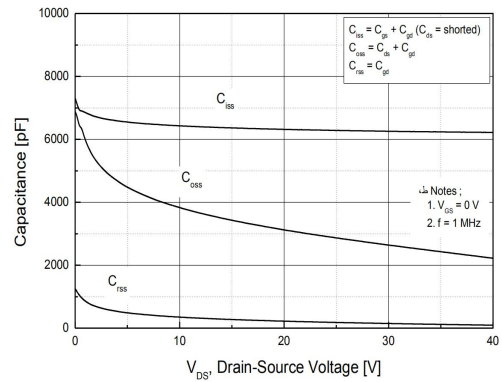
**Fig.5 Transfer Characteristics**



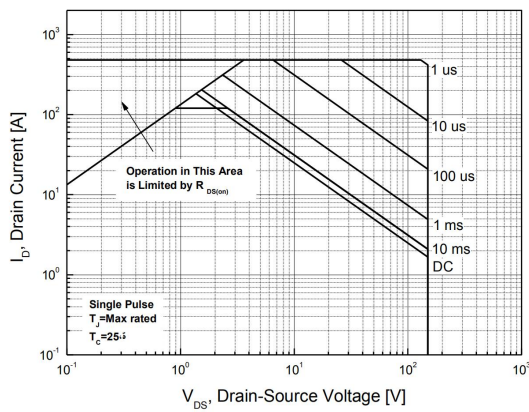
**Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature**



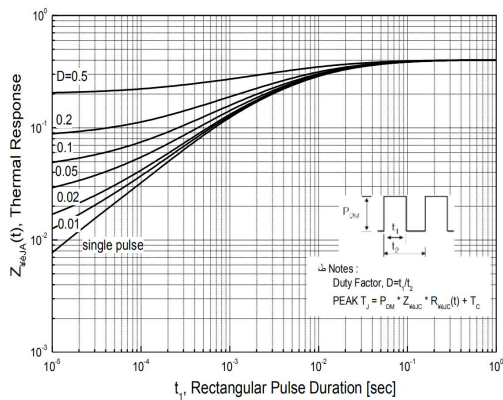
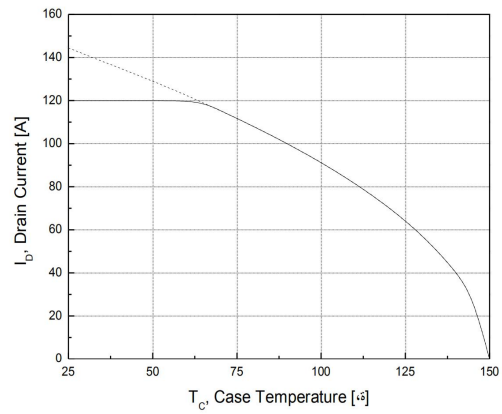
**Fig.7 Gate Charge Characteristics**



**Fig.8 Capacitance Characteristics**



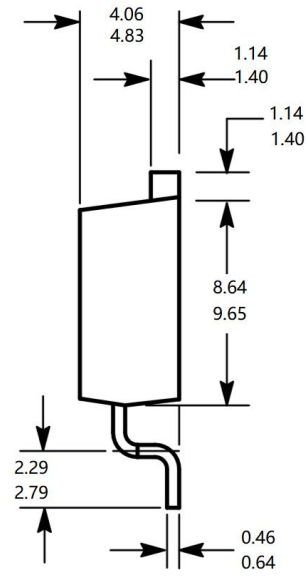
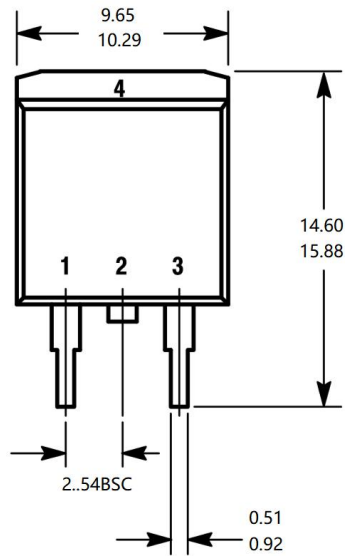
**Fig.9 Maximum Safe Operating Area**



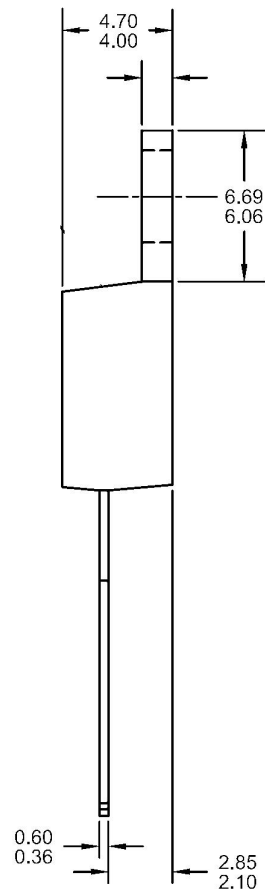
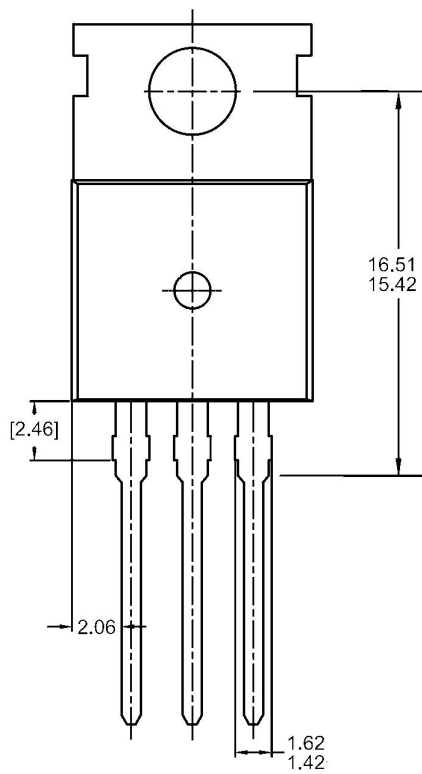
**Fig.11 Transient Thermal Response Curve**

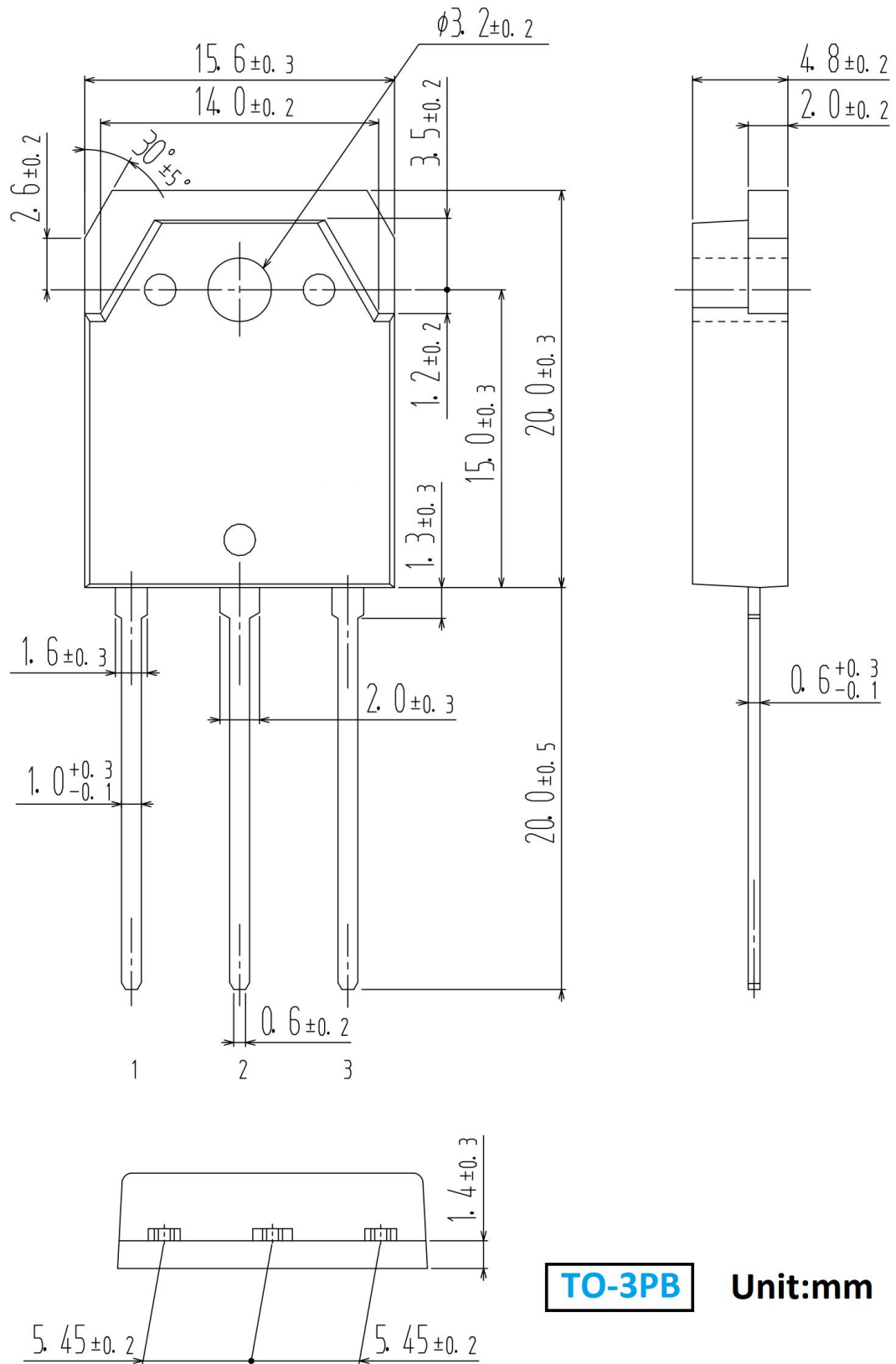
### Package

TO-263/D2PAK



TO-220





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