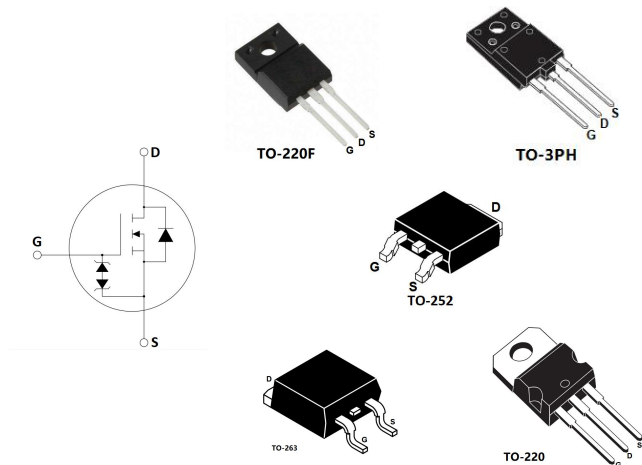


### Features

- Extremely high dv/dt capability
- 100% avalanche tested
- Gate charge minimized
- Very low intrinsic capacitances
- Very good manufacturing repeatability



### Applications

- Switching application

### Electrical ratings(Absolute maximum ratings)

Parameter	Symbol	Value				Unit
		TO-3PH	TO-220F	TO-252	TO-220/ TO-263	
Drain-source voltage ( $V_{GS}=0$ )	$V_{DS}$	1000				V
Gate-source voltage	$V_{GS}$	$\pm 30$				
Avalanche current repetitive or not-repetitive (pulse width limited by $T_j$ Max)	$I_{AR}$	5				A
Single pulse avalanche energy (starting $T_j=25^\circ\text{C}$ $I_d=I_{AR}$ $V_{dd}=50\text{V}$ )	$E_{AS}$	583				mJ
Drain current (continuous) at $TC=25^\circ\text{C}$	$I_D$	5				A
Drain current (continuous) at $TC=100^\circ\text{C}$	$I_D$	3				
Drain current (pulsed)	$I_{DM}$	18	18	18	18	
Total dissipation at $TC=25^\circ\text{C}$	$P_D$	74	48	104	198	W
Operating junction temperature	$T_J$	-55 to 150				$^\circ\text{C}$
Storage temperature	$T_{STG}$					
Maximum lead temperature for soldering purpose	$T_L$	300				$^\circ\text{C}$

### Electrical Characteristics( $T_j=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
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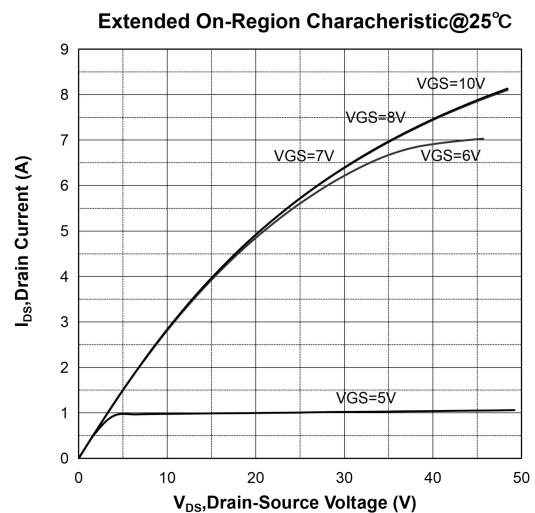
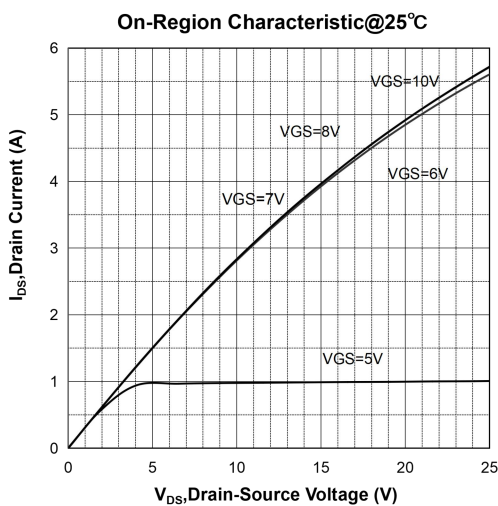
On/off states						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D=1mA$ $V_{GS}=0$	1000			V
Zero gate voltage drain current ( $V_{GS}=0$ )	$I_{DSS}$	$V_{DS}=\text{Max rating}$			1	$\mu A$
		$T_C=125^\circ C$			50	$\mu A$
Gate body leakage current ( $V_{GS}=0$ )	$I_{GSS}$	$V_{GS}=\pm 20V$			$\pm 100$	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2.25	3	3.75	V
Static drain-source on resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=1A$		3.5	4.2	$\Omega$
Forward transconductance	$g_{fs}$	$V_{DS} = 27 V, I_D = 5A$		5.6		S
Dynamic						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Input capacitance	$C_{iss}$	$V_{DS}=25V, f=1MHz, V_{GS}=0$		506		pF
Output capacitance	$C_{oss}$			59		
Reverse transfer capacitance	$C_{rss}$			3		
Total gate charge	$Q_g$	$V_{DD}=800V,$ $I_D=2.5A$ $V_{GS}=10V,$ $R_G = 4.7 \Omega$		18.68		nC
Gate-source charge	$Q_{gs}$			2.1		
Gate-drain charge	$Q_{gd}$			7.3		
Switching times						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 800 V,$ $I_D = 2.5 A,$ $R_G = 25\Omega,$ $V_{GS} = 10 V$		35.6		ns
Rise time	$t_r$			22.9		
Turn-off-delay time	$t_{d(off)}$			42.7		
Fall time	$t_f$			13.6		
Source Drain Diode						
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Source Drain Current	$I_{SD}$			5		A
Source Drain Current(Pulsed)	$I_{SDM}$			18		A
Forward On Voltage	$V_{SD}$	$I_{SD}=5A, V_{GS}=0V$		0.8	1.2	V
Reverse Recovery Time	$T_{rr}$	$I_{SD}=5A,$ $di/dt=200A/\mu S$		1.02		us

Reverse Recovery Charge	Q <sub>rr</sub>	V <sub>R</sub> =100V, T <sub>j</sub> =150°C		3.68		uC
<b>Thermal data</b>						
Parameter	Symbol	Value				Unit
		TO-3PH	TO-220F	TO-252	TO-220/ TO-263	
Thermal resistance junction max	R <sub>thj-case</sub>	1.69	2.6	1.2	0.63	°C/W
Thermal resistance junction-ambient max	R <sub>tha-case</sub>	47.4	58	68	35	°C/W

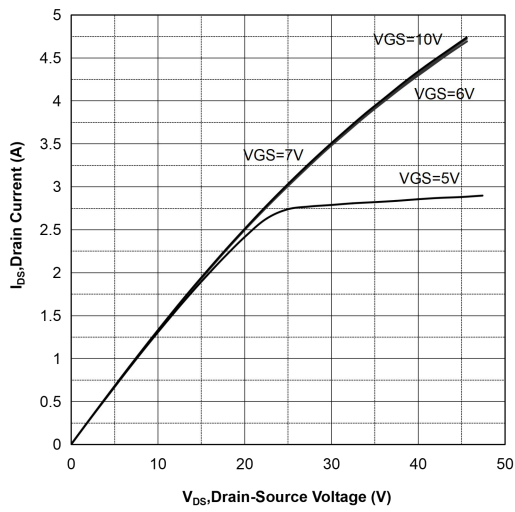
### Order codes

Partnumber	Marking	Package
MS5N100	MS5N100	TO-3PH
MS5N100S	MS5N100S	TO-220F
MS5N100FT	MS5N100FT	TO-220
MS5N100FE	MS5N100FE	TO-263/D2PAK
MS5N100FD	MS5N100FD	TO-252/DPAK

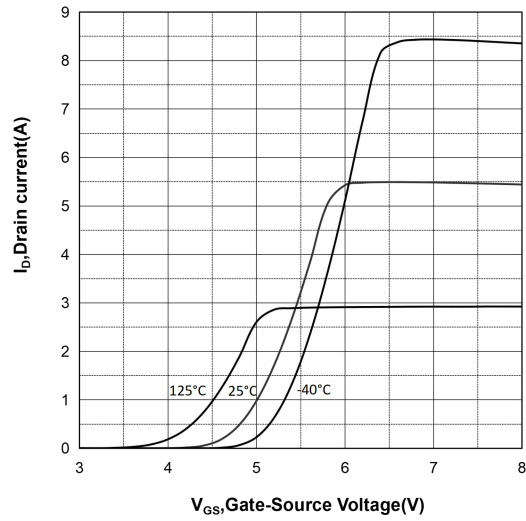
### Electrical characteristics (curves)



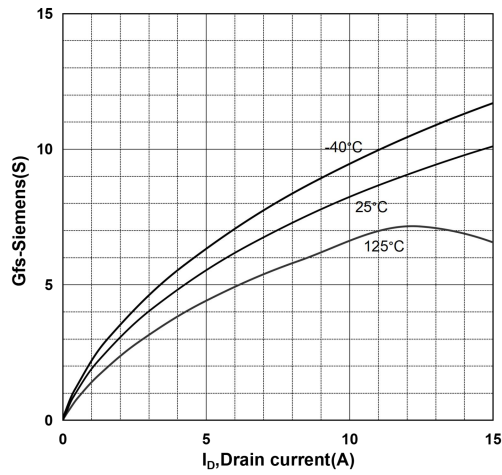
**On-Region Characteristic@125°C**



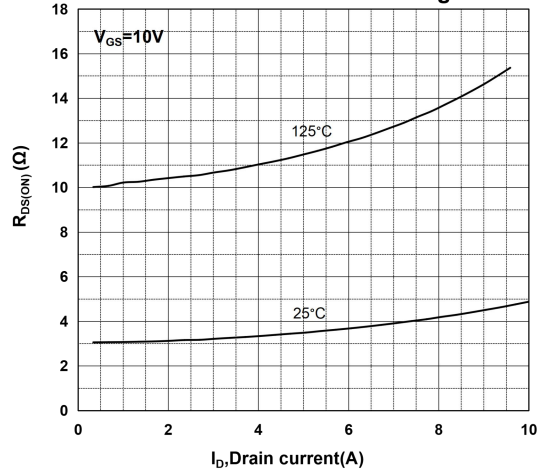
**Transfer Characteristics**



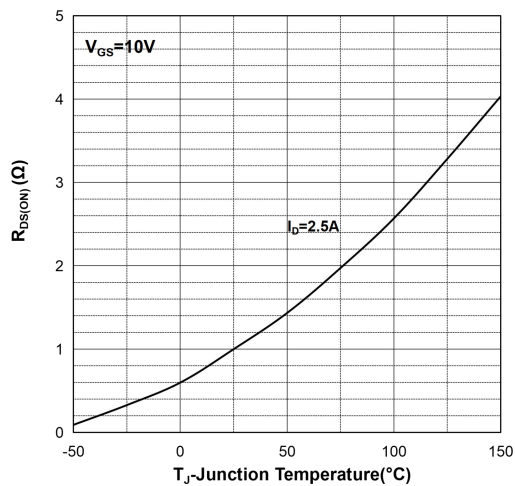
**Transconductance**



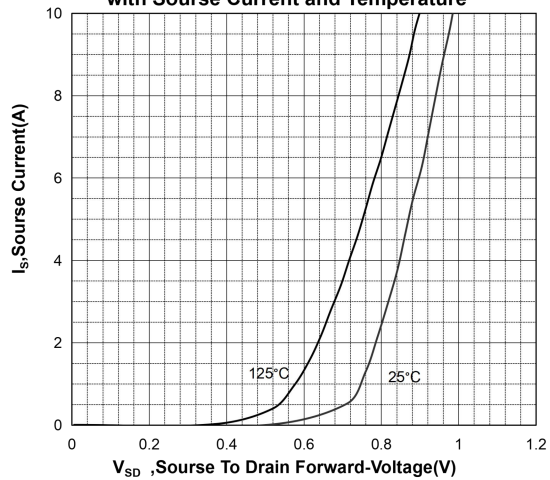
**On-Resistance Variation vs Drain Current and Gate Voltage**

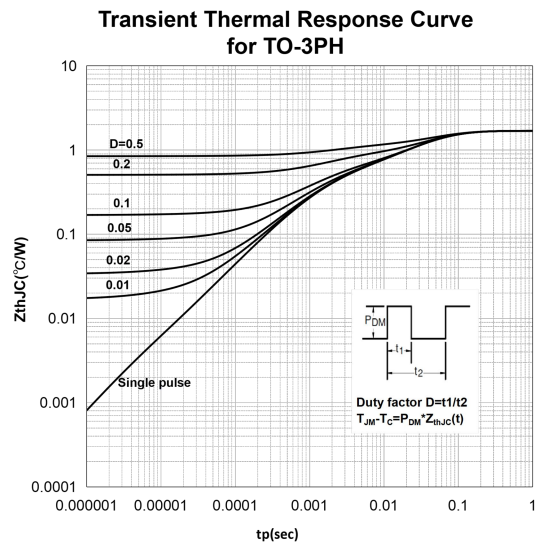
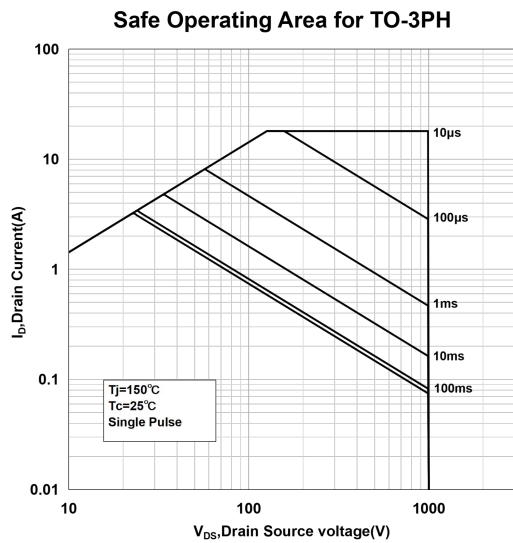
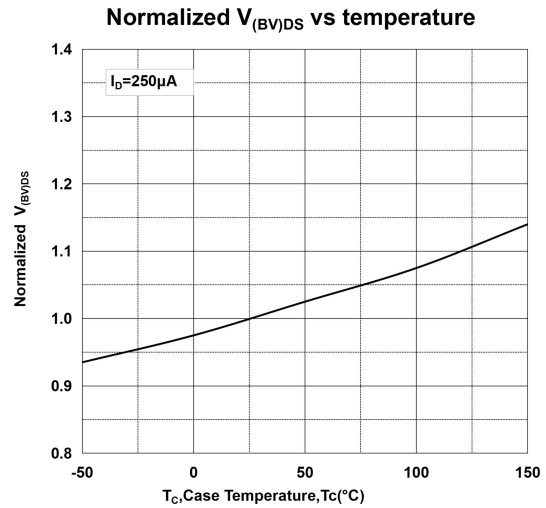
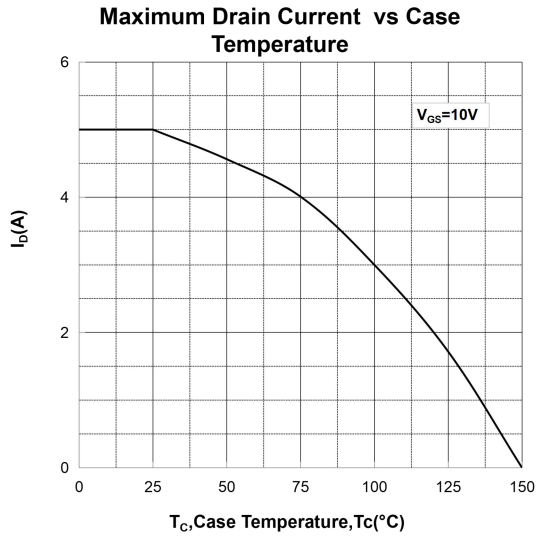
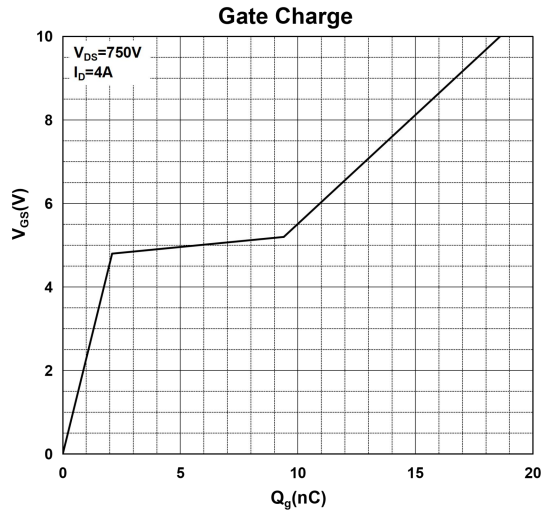
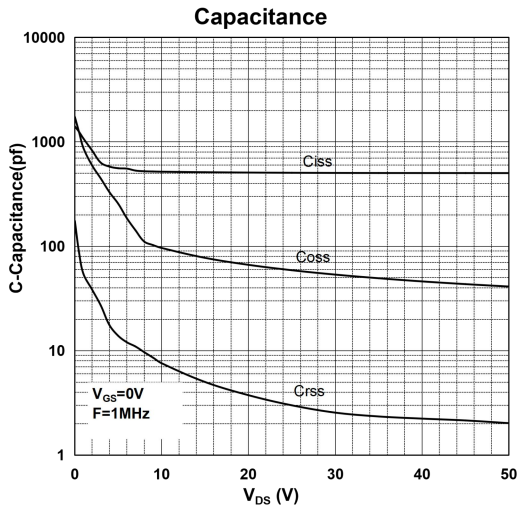


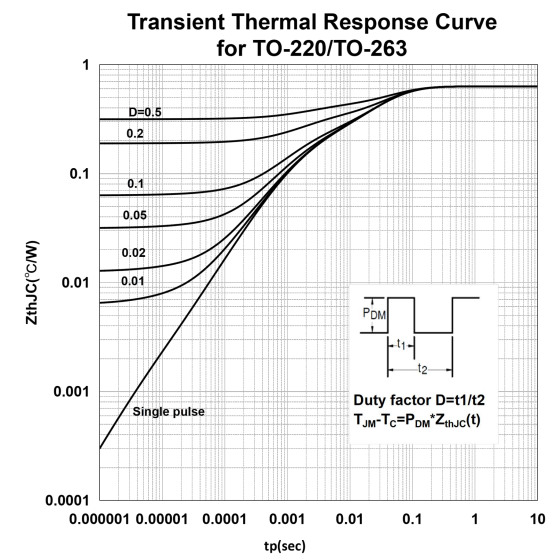
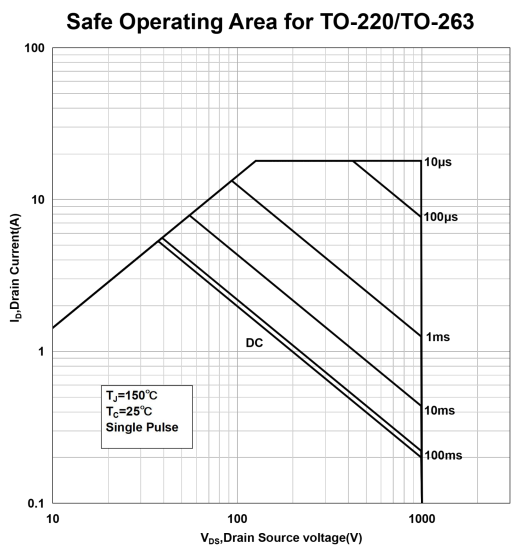
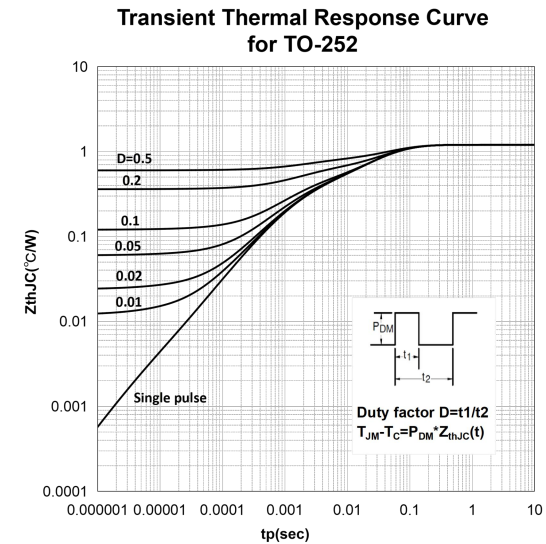
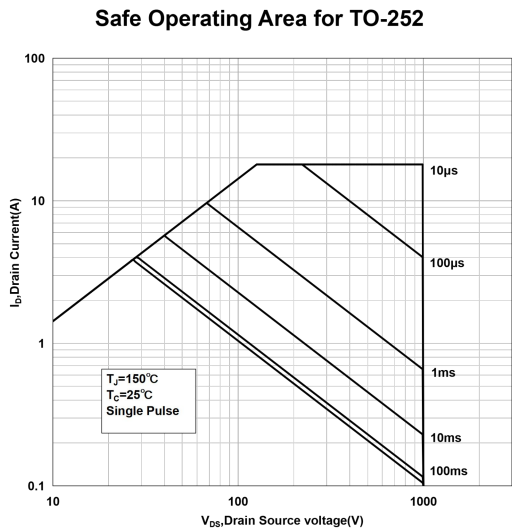
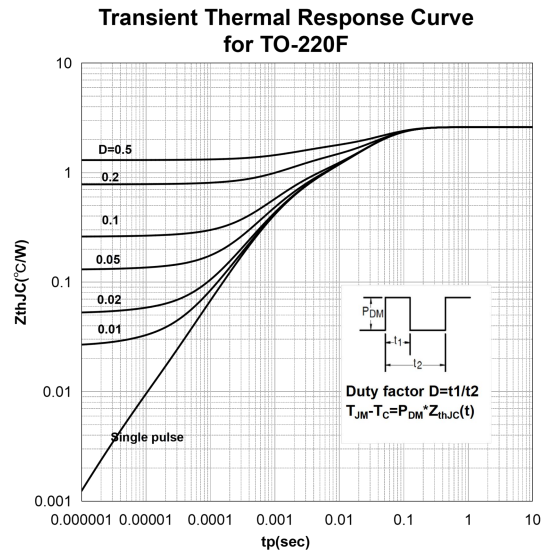
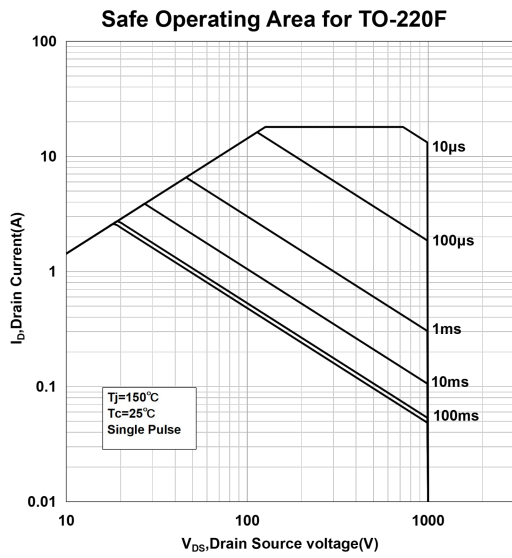
**On-Resistance Variation vs Temperature**



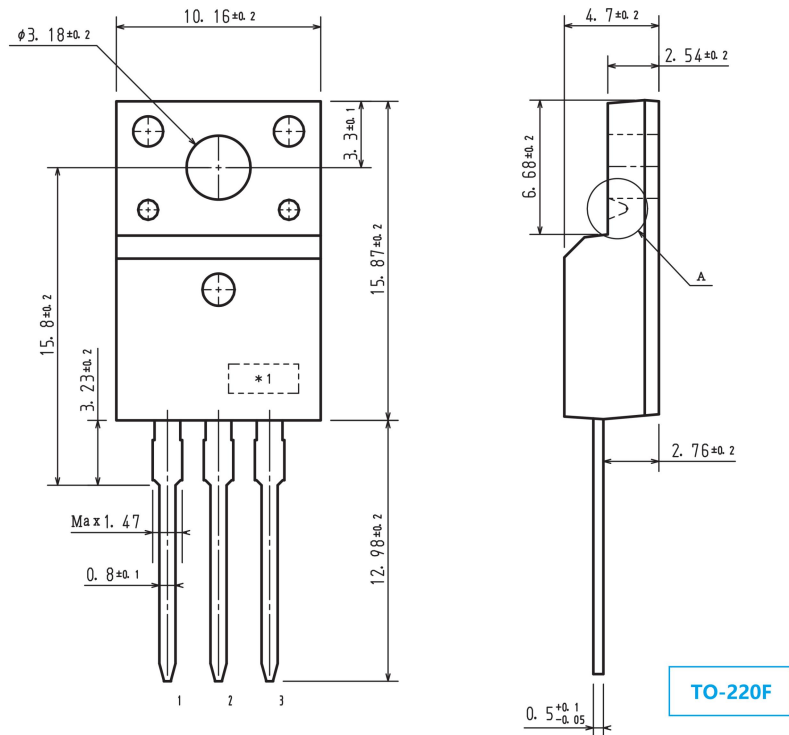
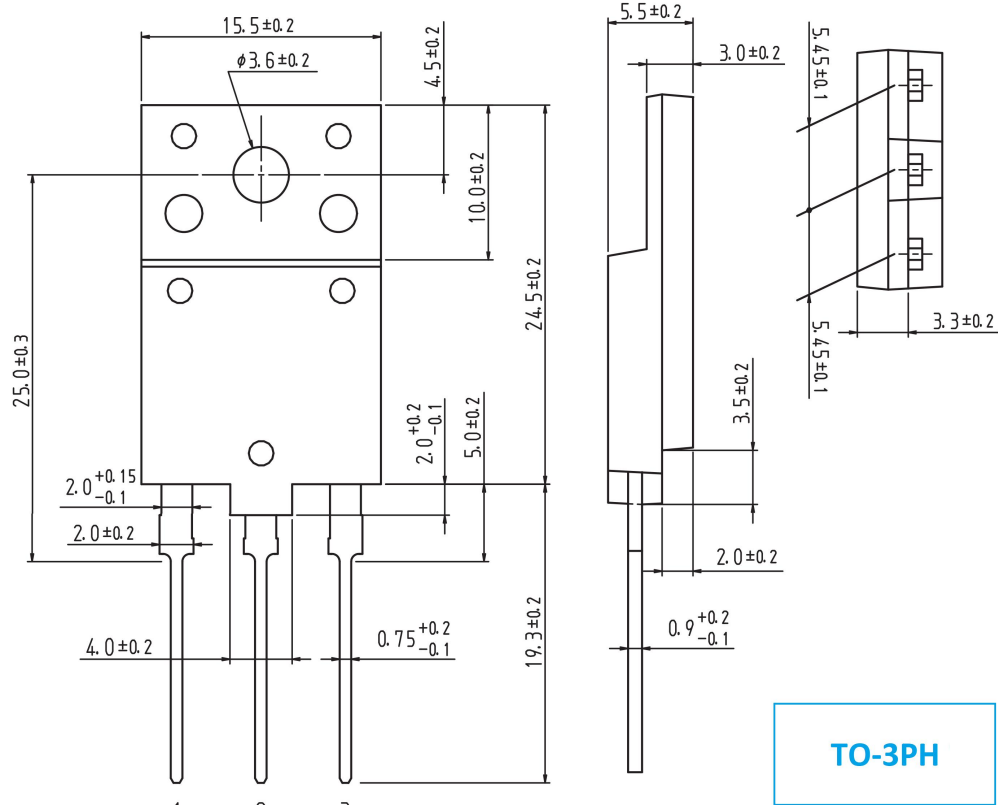
**Body Diode Forward Voltage Variation with Source Current and Temperature**



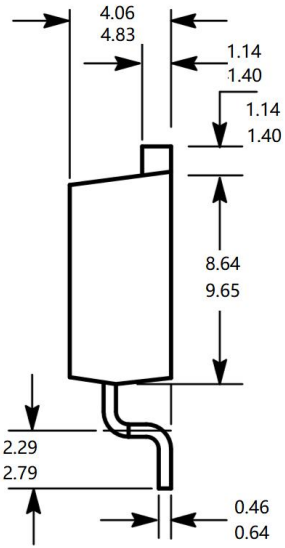
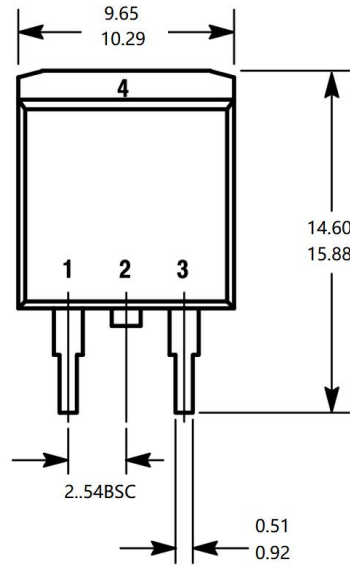




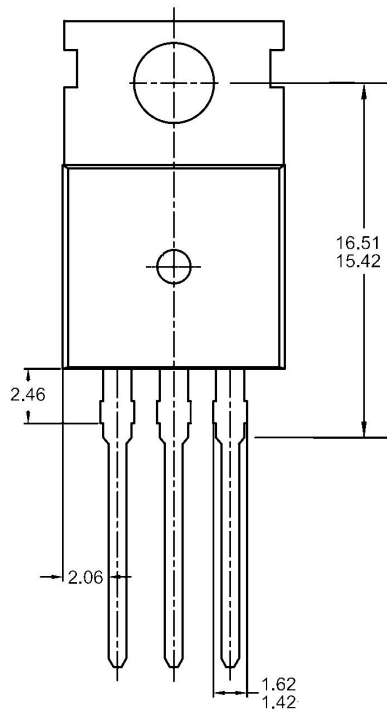
## Package outline dimension



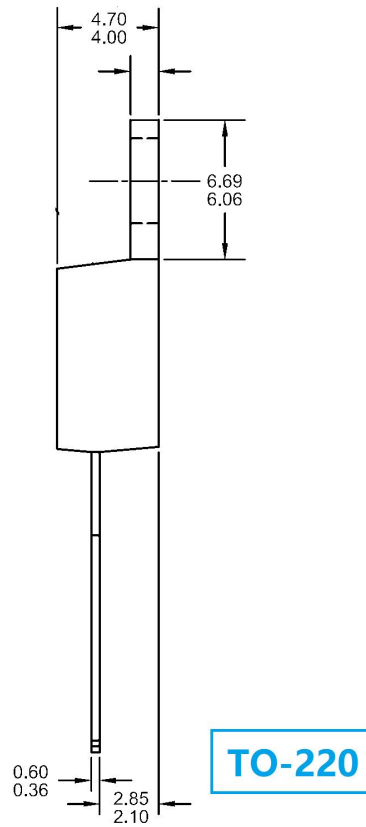
**TO-263/D2PAK**



**TO-263/D2PAK**



**TO-220**



**TO-220**



