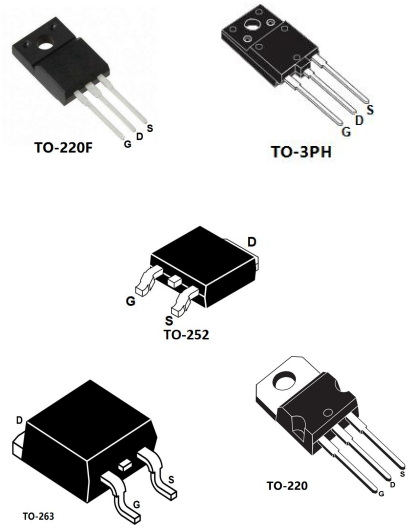
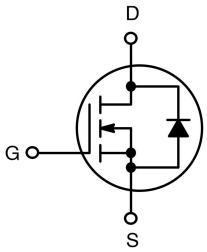
N-channel 1000V – 3.5Ω 5A

General features

Type	VDSS(@Tjmax)	RDS(on)	ID
SL5N100P	1000 V	< 4.2 Ω	5A
SL5N100F	1000 V	< 4.2 Ω	5A
SL5N100	1000 V	< 4.2 Ω	5A
SL5N100K	1000 V	< 4.2 Ω	5A
SL5N100D	1000 V	< 4.2 Ω	5A

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





Applications

- Switching application

Order codes

Partnumber	Package
SL5N100P	TO-3PH
SL5N100F	TO-220F
SL5N100	TO-220
SL5N100K	TO-263/D2PAK
SL5N100D	TO-252/DPAK

Electrical ratings

Absolute maximum ratings

Parameter	Symbol	Value				Unit
		TO-3PH	TO-220F	TO-220/ TO-252	TO-263	
Drain-source voltage（V_{GS}=0)	V_{DS}	1000				V
Gate-source voltage	V_{GS}	±30				
Drain current（continuous）at TC=25℃	I_D	5				A
Drain current（continuous）at TC=100℃	I_D	3				
Drain current（pulsed）	I_{DM}	18	18	18	18	
Total dissipation at TC=25℃	PTOT	48	60	60	80	W

Drain source ESD (HBM-C=100pF,R=1.5KΩ)	$V_{ESD(GS)}$	4000	V
Peak diode recovery voltage slope	dv/dt	4.5	V/ns
Insulation withstand voltage(RMS)from all three leads to external heat sink (t=1s TC=25℃)	V_{ISO}	2500	v
Operating junction temperature	T_J	-55 to 175	℃
Storage temperature	T_{STG}		

Thermal data

Parameter	Symbol	Value				Unit
		TO-220F	TO-3PH	TO-220/ TO-252	TO-263	
Thermal resistance junction max	Rthj-case	4.2	2.6	4.2	0.63	℃/W
Thermal resistance junction-ambient max	Rtha-case	68	58	68	35	℃/W
Maximum lead temperature for soldering purpose	T	350				mJ

Avalanche characteristics

Parameter	Symbol	Value	Unit
Avalanche current repetitive or not-repetitive (pulse width limited by Tj Max)	IAR	5	A
Single pulse avalanche energy (starting Tj=25℃ Id=lar Vdd=50V)	EAS	583	mJ

Electrical characteristics (T_{CASE}=25℃ unless otherwise specified)

On/off states

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-source breakdown voltage	V(BR)DSS	ID=1mA VGS=0	1000			V
Zero gate voltage drain current (VGS=0)	IDSS	VDS=Max rating			1	μA
		TC=125℃			50	μA
Gate body leakage current (VGS=0)	IGSS	VGS=±20V			±10	μA
Gate threshold voltage	VGS(th)	VDS=VGS ID=100μA	3	3.5	4.5	V

Static drain-source on resistance	RDS(on)	VGS=10V ID=1.75A		3.5	4.2	Ω

Dynamic

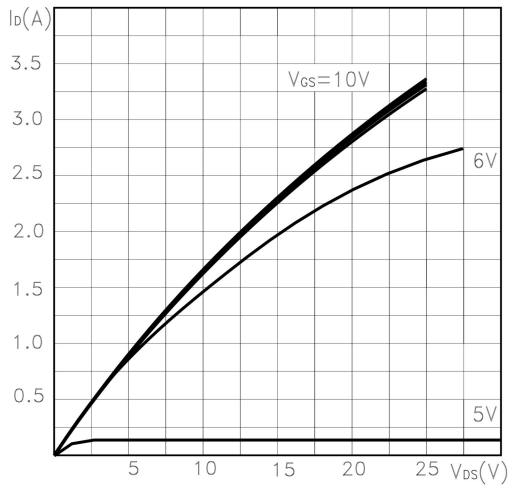
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Forward transconductance	g_{fs}	V_{DS} = 40 V, I_D = 4A		5		S
Input capacitance	C_{iss}	V_{DS}=25V,f=1MHz,V_{GS}=0		483		pF
Output capacitance	C_{oss}			45		
Reverse transfer capacitance	C_{rss}			9		
Equivalent Output capacitance	$C_{oss\ eq.}$	V_{GS}=0,V_{DS}=0 to 800V		46.8		
Gate input resistance	R_g	f=1MHz Gate DC Bias=0 Test signal level=20mV open drain		3.65		Ω
Total gate charge	Q_g	V_{DD}=750V,I_D=4A V_{GS}=10V		12.67		nC
Gate-source charge	Q_{gs}			3.7		
Gate-drain charge	Q_{gd}			4.23		
Turn-on delay time	$t_{d(on)}$	V_{DD} = 500 V, I_D = 1.75 A, R_G = 4.7 Ω, V_{GS} = 10 V		11.3		ns
Rise time	t_r			18.5		
Turn-off-delay time	$t_{d(off)}$			55		
Fall time	t_f			17		

Source Drain Diode

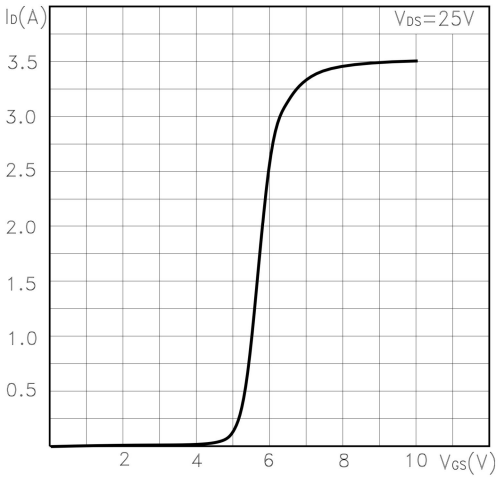
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Source Drain Current	I_{SD}				5	A
Source Drain Current(Pulsed)	I_{SDM}				20	A
Forward On Voltage	V_{SD}	I_{SD}=5A,V_{GS}=0V			1.2	V
Reverse Recovery Time	Trr	I_{SD}=4A,di/dt=100A/μS		154		ns
Reverse Recovery Charge	Qrr	V_R=100V,Tj=150℃		677		nC
Reverse Recovery Current	I_{RRM}			5.23		A

Electrical characteristics (curves)

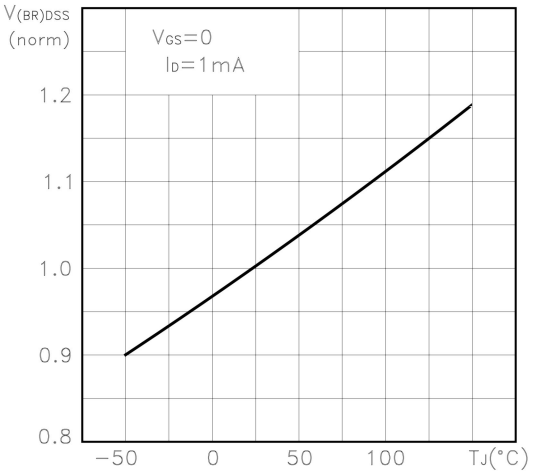
Output characteristics



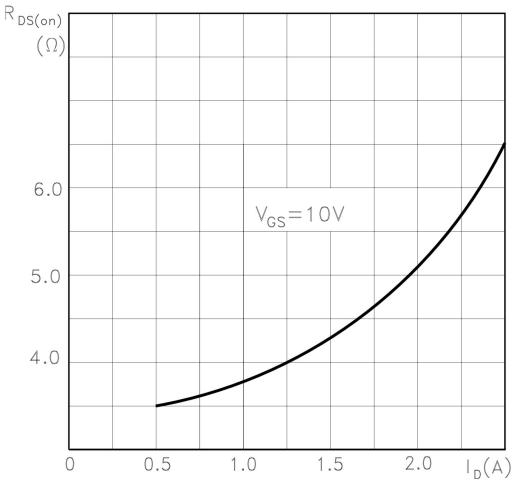
Transfer characteristics



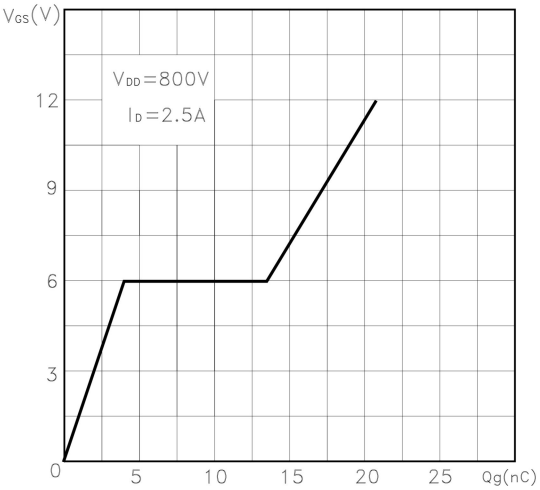
Normalized BV_{DSS} vs. temperature



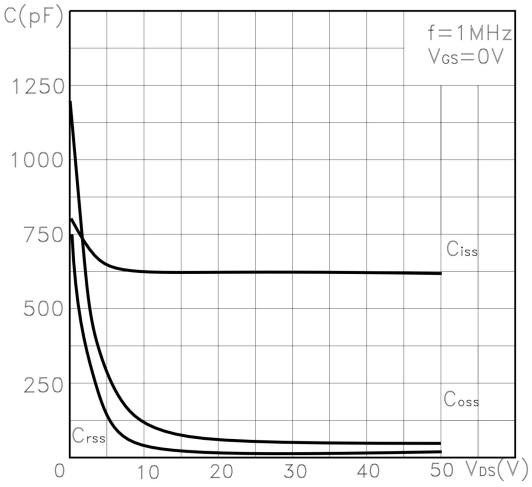
Static drain-source on resistance



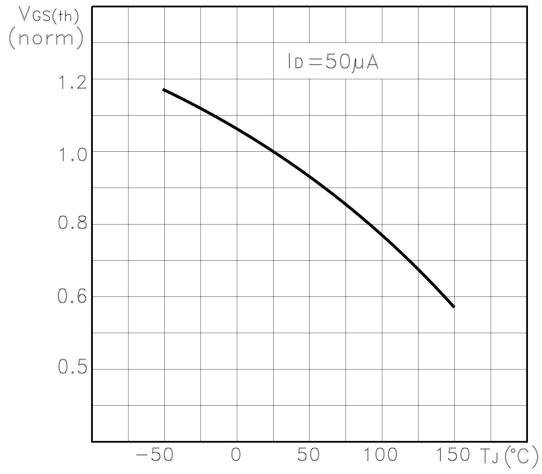
Gate charge vs. gate-source voltage



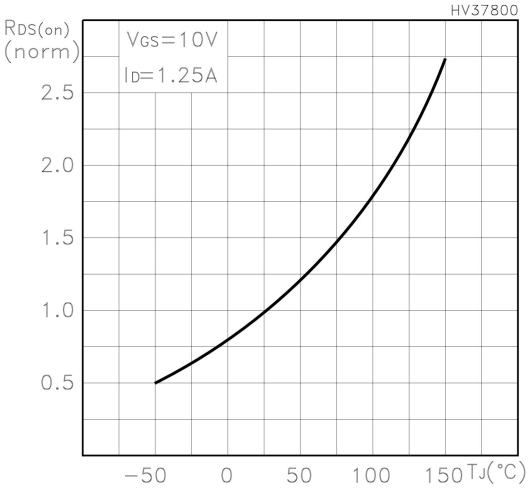
Capacitance variations



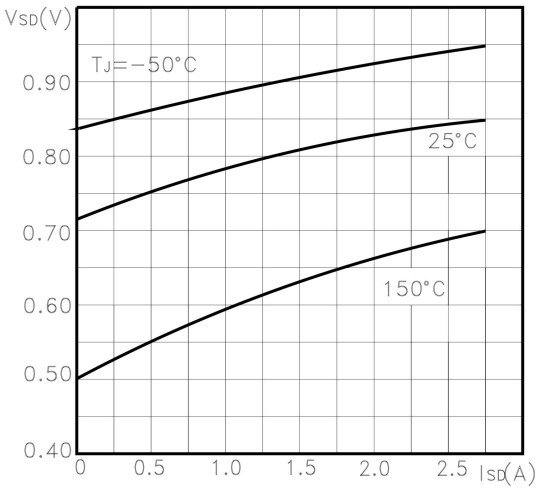
Normalized gate threshold voltage vs. temperature



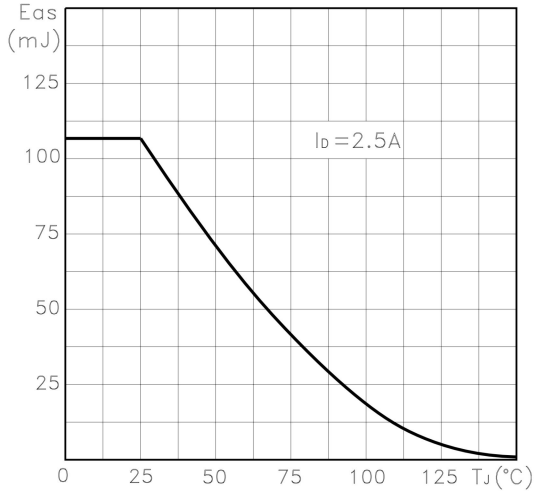
Normalized on resistance vs. temperature



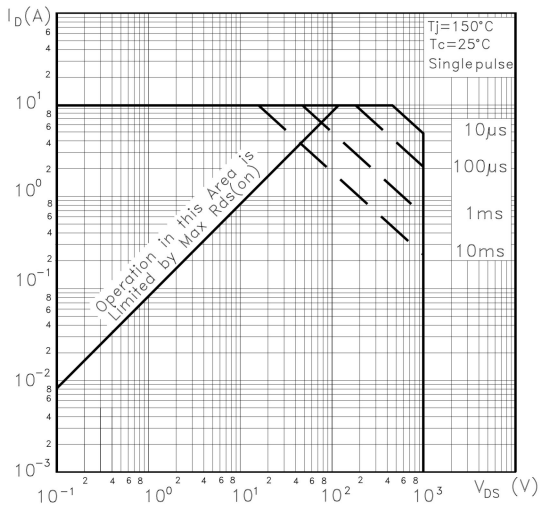
Source-drain diode forward characteristics



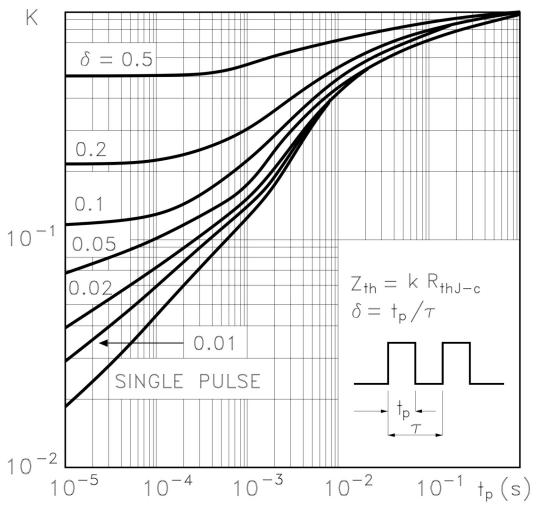
Maximum avalanche energy vs Tj



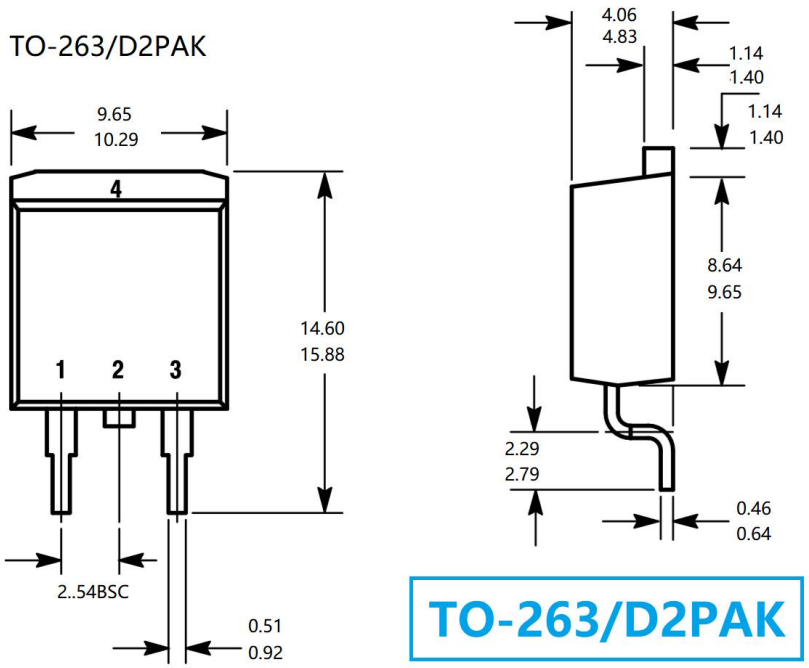
Safe operating area

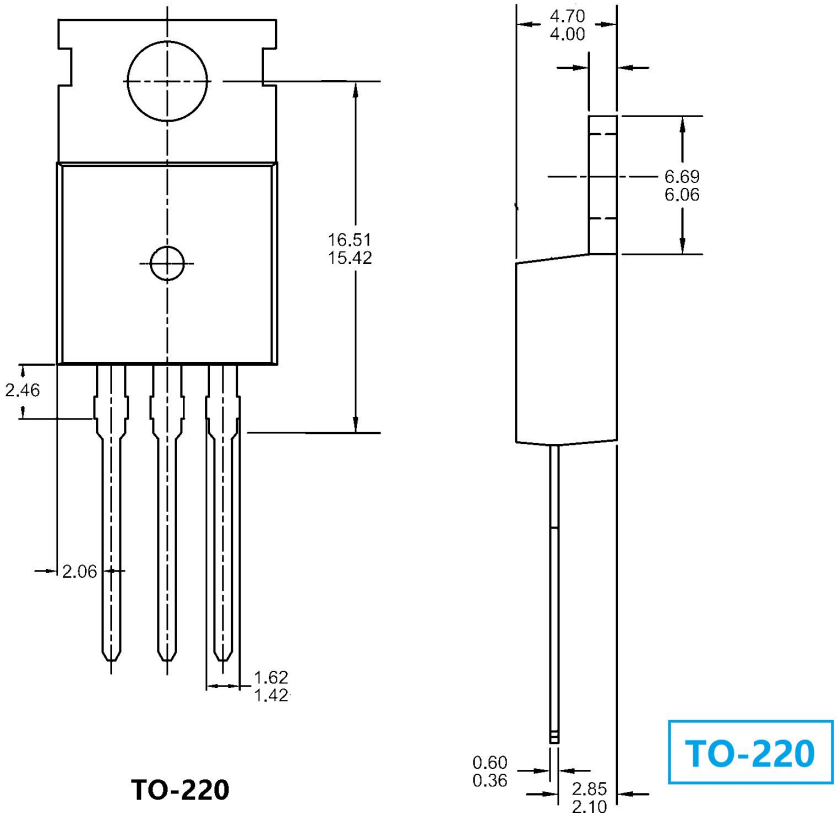


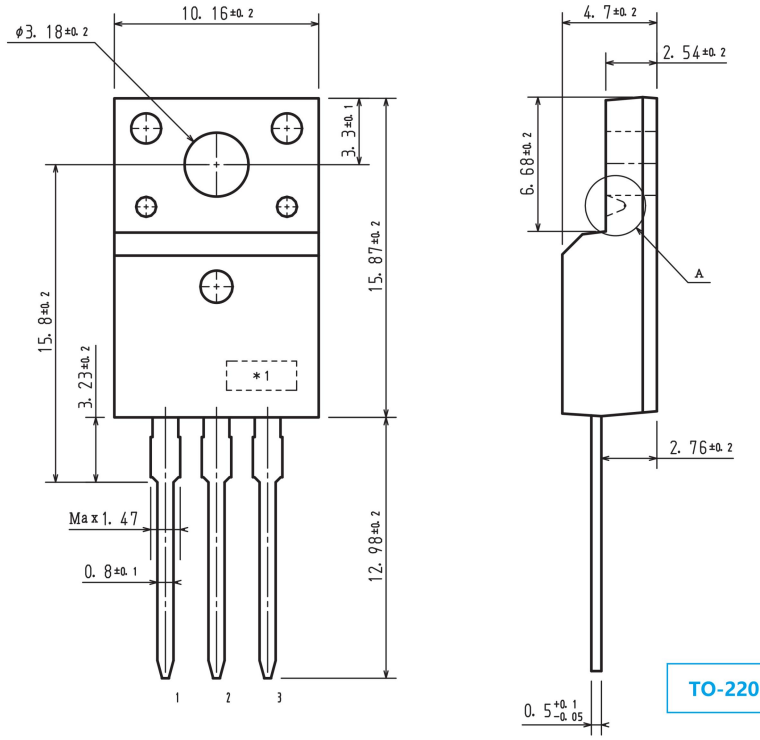
Thermal impedance



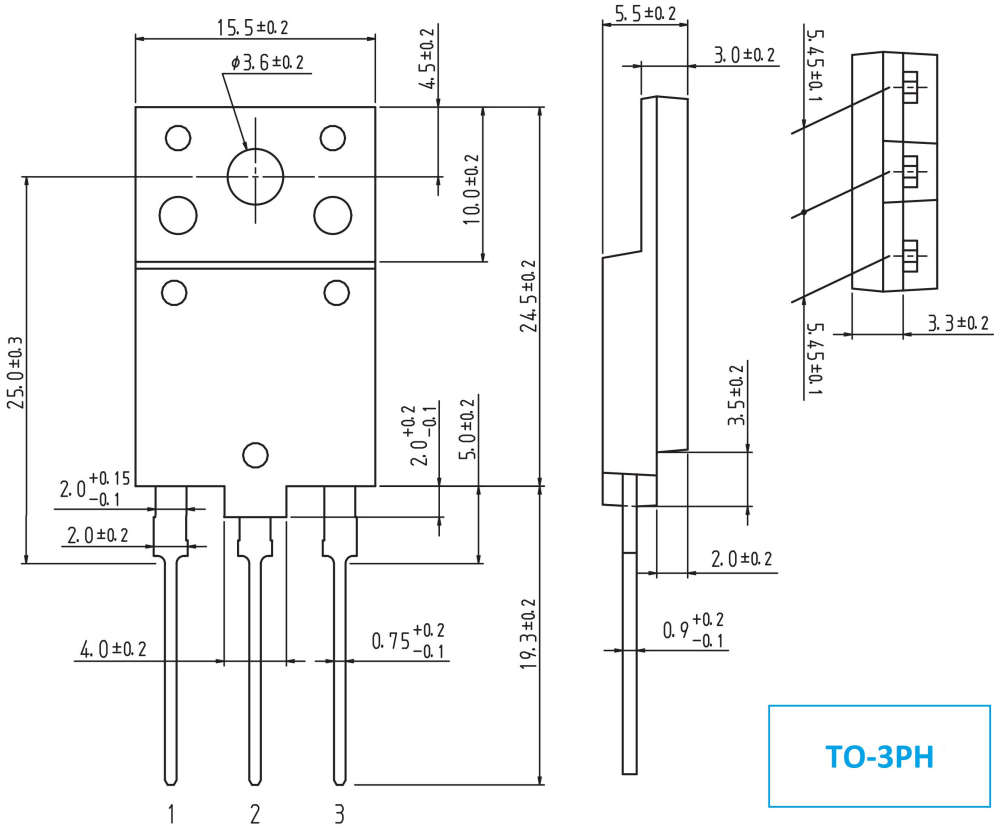
Package outline dimension



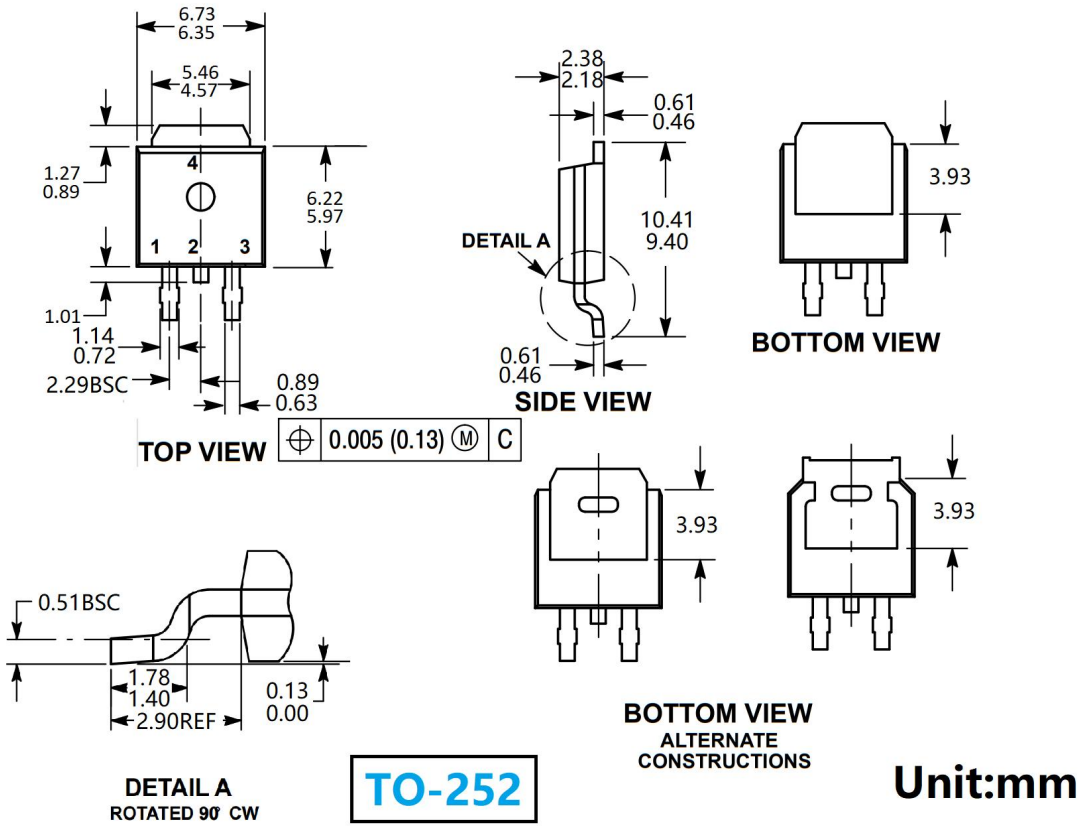




TO-220F



TO-3PH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5.46
4.57
1.27
0.89
6.22
5.97
4
1 2 3
1.01
1.14
0.72
2.29BSC
0.89
0.63
TOP VIEW
0.005 (0.13) M C
2.38
2.18
0.61
0.46
DETAIL A
10.41
9.40
0.61
0.46
SIDE VIEW
3.93
BOTTOM VIEW
3.93
3.93
BOTTOM VIEW
ALTERNATE
CONSTRUCTIONS
0.51BSC
1.78
1.40
2.90REF
0.13
0.00
DETAIL A
ROTATED 90° CW
TO-252
Unit:mm