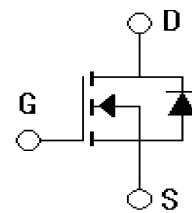
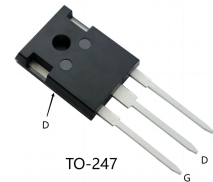
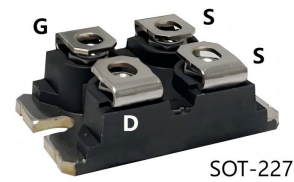


Features

- Low $R_{DS(on)}$
- Fast switching
- 100% avalanche tested
- Low package inductance
- Low intrinsic Rectifier
- High current handing diode



Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC chopper
- AC motor drives
- Uninterruptible power supplies
- Linear current regulators

Absolute Ratings ($T_c=25^\circ\text{C}$)

Parameter	Symbol		Value	Unit
Drain-Source Voltage	V_{DSS}		150	V
Transient Gate-Source Voltage	V_{GSM}		±30	V
Continuous Gate-Source Voltage	V_{GSS}		±20	V
Drain Current -continuous	I_D	T=25℃	330	A
		T=100℃	165	A
Drain Current - pulse （note 1）	I_{DM}		1320	A
Single Pulsed Avalanche Energy （note 2）	E_{AS}		4000	mJ
Avalanche Current （note 1）	I_{AR}		100	A
Repetitive Avalanche Current （note 1）	E_{AR}		64	mJ
Peak Diode Recovery dv/dt （note 3）	dv/dt		20	V/ns
Power Dissipation SOT-227	PD,TC=25℃		893	W
	-Derate above 25℃		5.96	W/℃
Power Dissipation TO-247	PD,TC=25℃		463	W
	-Derate above 25℃		3.08	W/℃
Operating and Storage Temperature Range	T_J, T_{STG}		-55~+150	℃

Maximum Lead Temperature for Soldering Purposes	T_L	300	$^{\circ}\text{C}$
Isolation voltage for terminal to case ($I_{\text{ISOL}} \leq 1\text{mA}, t=1\text{s}, \text{DC}$)	V_{ISO}	3000	V

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

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
Off-Characteristics						
Drain-Source Voltage	BV_{DSS}	$I_D=250\mu\text{A}, V_{\text{GS}}=0\text{V}$	150	-	-	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{\text{DSS}} / \Delta T_J$	$I_D=250\mu\text{A}$, referenced to 25°C	-	0.16	-	$\text{V}/^{\circ}\text{C}$
Drain cut-off current	I_{DSS}	$V_{\text{DS}}=V_{\text{DSS}}, V_{\text{GS}}=0\text{V}$ $T_J=25^{\circ}\text{C}$	-	-	100	μA
		$V_{\text{DS}}=V_{\text{DSS}}, T_J=125^{\circ}\text{C}$	-	-	2000	
Gate-body leakage current, forward	I_{GSSF}	$V_{\text{DS}}=0\text{V}, V_{\text{GS}}=20\text{V}$	-	-	500	nA
Gate-body leakage current, reverse	I_{GSSR}	$V_{\text{DS}}=0\text{V}, V_{\text{GS}}=-20\text{V}$	-	-	-500	nA
On-Characteristics						
Gate Threshold Voltage	$V_{\text{GS(th)}}$	$V_{\text{DS}}=V_{\text{GS}}, I_D=250\mu\text{A}$	2.5	3.5	4.5	V
Static Drain-Source On-Resistance	$R_{\text{DS(ON)}}$	$V_{\text{GS}}=10\text{V}, I_D=20\text{A}$ (note 3)	-	3.8	4.5	$\text{m}\Omega$
Forward Transconductance	g_{fs}	$V_{\text{DS}}=10\text{V}, I_D=60\text{A}$ (note 3)	-	220	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{\text{DS}}=25\text{V},$ $V_{\text{GS}}=0\text{V},$ $f=1.0\text{MHz}$	-	47	-	nF
Output capacitance	C_{oss}		-	2700	-	pF
Reverse transfer capacitance	C_{rss}		-	630	-	pF

Switching Characteristics						
Turn-On delay time	$t_{\text{d(on)}}$	$V_{\text{DD}}=75\text{V}, I_D=165\text{A},$ $R_G=5\Omega,$ $V_{\text{GS}}=10\text{V}(\text{note } 4,5)$	-	90	-	ns
Turn-On rise time	t_r		-	185	-	ns
Turn-Off delay time	$T_{\text{d(off)}}$		-	170	-	ns
Turn-Off Fall time	t_f		-	240	-	ns
Total Gate Charge	Q_g	$V_{\text{DS}}=50\text{V},$ $I_D=165\text{A},$ $V_{\text{GS}}=10\text{V}(\text{note } 4,5)$	-	650	-	nC
Gate-Source charge	Q_{gs}		-	112	-	nC
Gate-Drain charge	Q_{gd}		-	206	-	nC

Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1A$ (note 3)	-	0.67	1.2	V
Continuous Drain-Source Diode Forward Current	I_S		-	-	330	A
Pulsed Drain-Source Diode Forward Current	I_{SM}		-	-	1320	A
Reverse recovery time	t_{rr}	$V_{GS}=0V, I_F=50A$ $di_F/dt=100A/us$ (note 3)	-	95	-	ns
Reverse recovery charge	Q_{rr}		-	1.23	-	uC

Thermal Characteristics

Parameter	Symbol	Value		Unit
		SOT-227	TO-247	
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.14	0.27	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	40	62.5	°C/W

Notes:

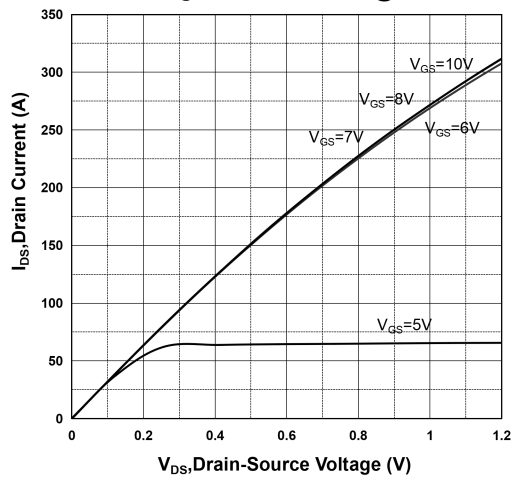
- 1: Pulse width limited by maximum junction temperature
- 2: $L=0.5mH$, $I_{AS}=100A$, $V_{DD}=50V$, $R_G=25\ \Omega$, Starting $T_J=25^\circ C$
- 3: $I_{SD} \leq 100A$, $di/dt \leq 300A/\mu s$, $V_{DD} \leq BV_{DSS}$, Starting $T_J=25^\circ C$
- 4: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 5: Essentially independent of operating temperature

Ordering information

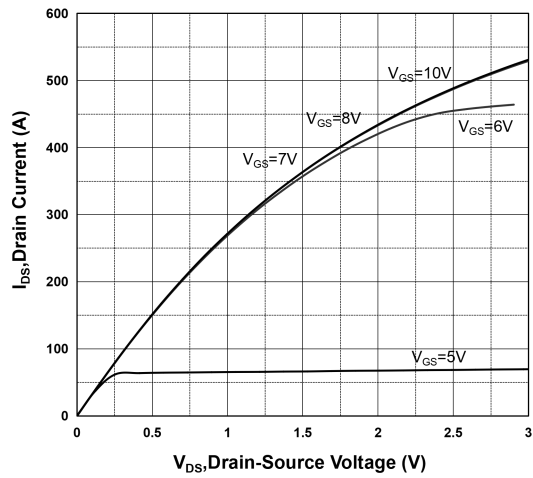
Marking	Package
MS330N15JDF4	SOT-227
MS330N15JDC0	TO-247

Electrical Characteristics

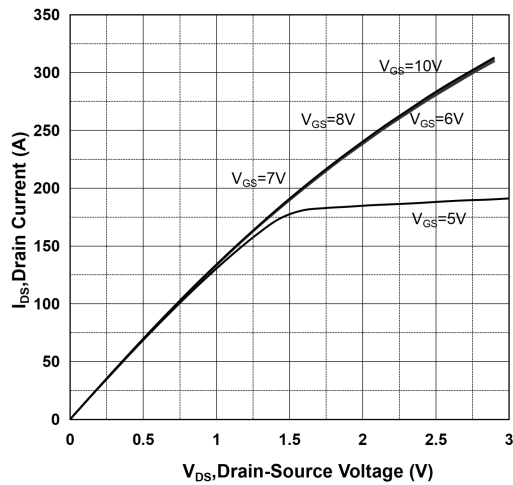
On-Region Characteristic@25°C



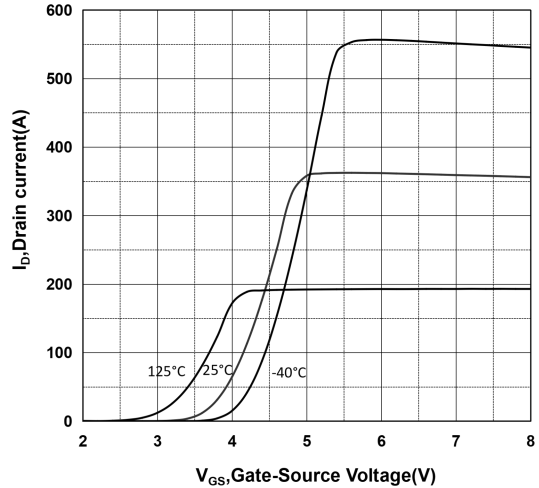
Extended On-Region Characteristic@25°C



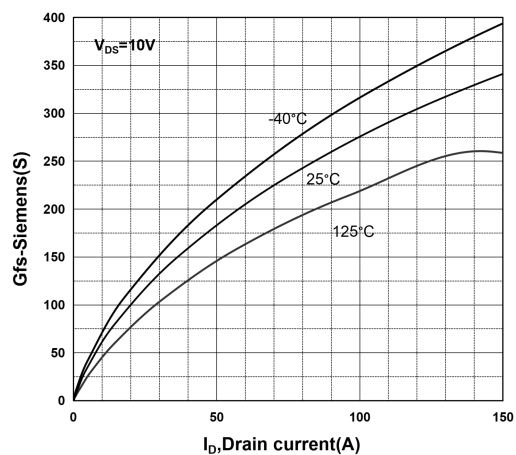
On-Region Characteristic@125°C



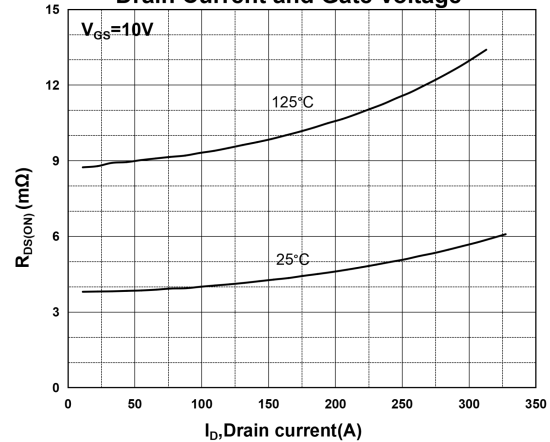
Transfer Characteristics

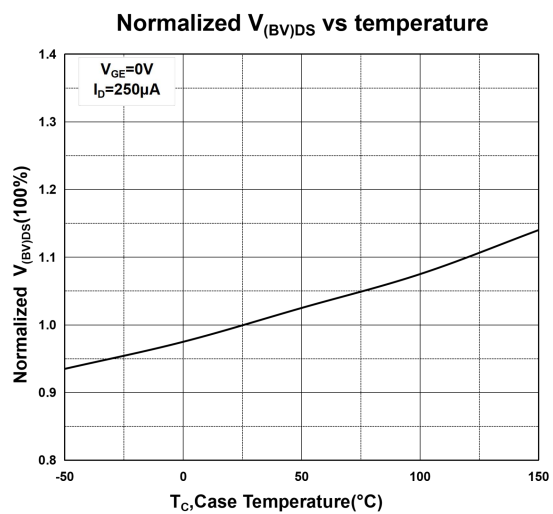
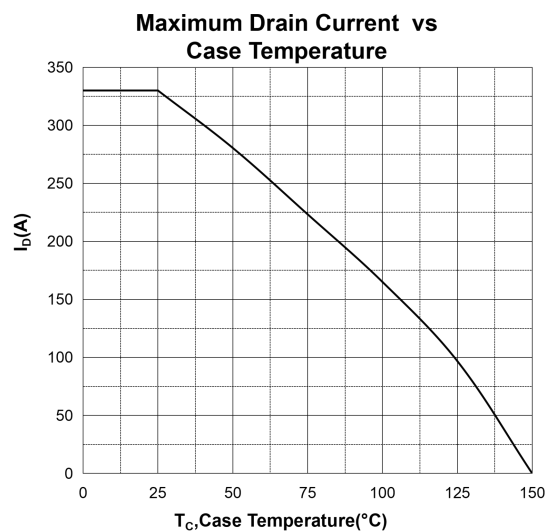
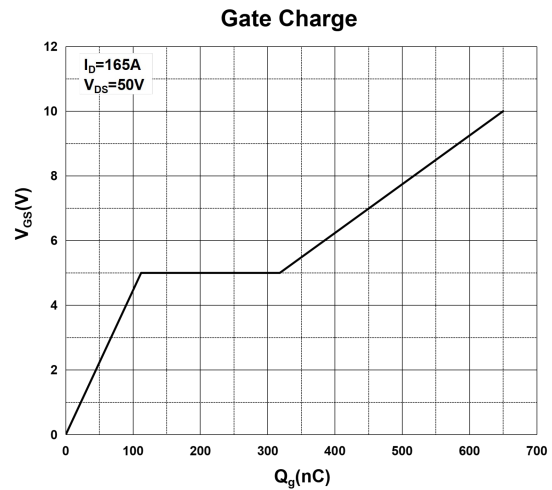
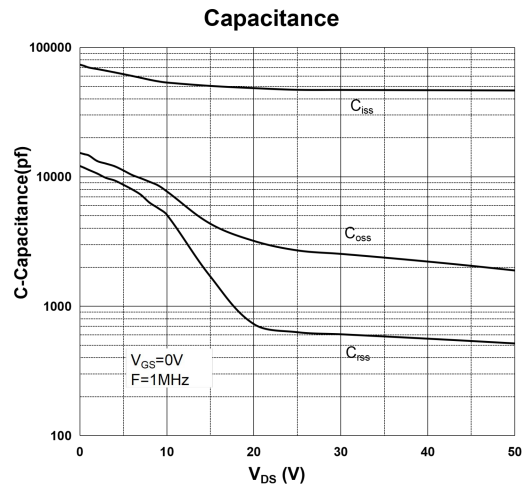
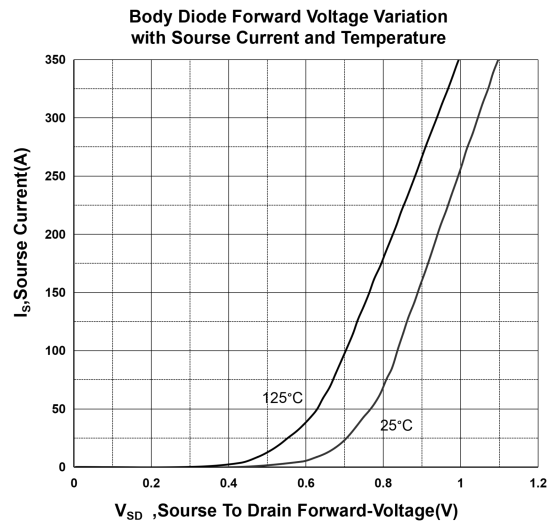
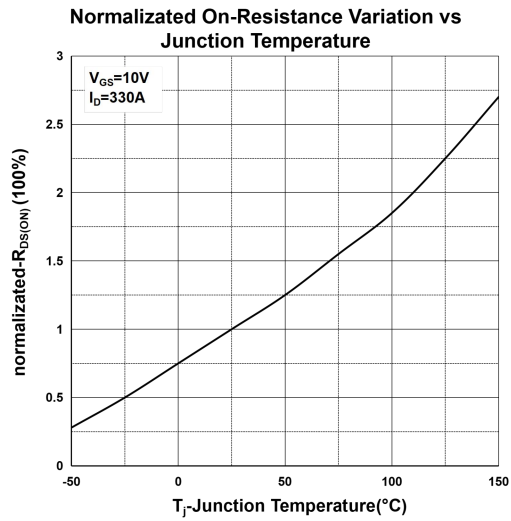


Transconductance

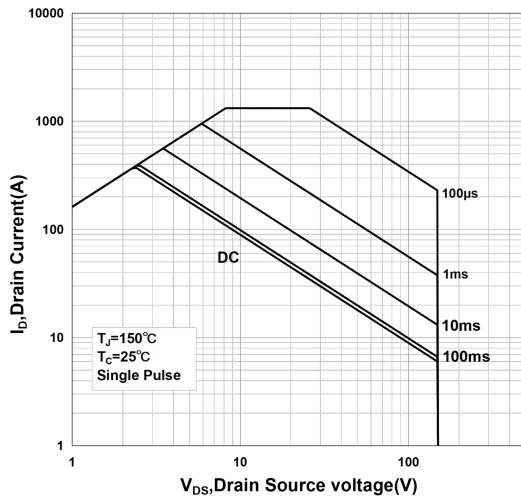


On-Resistance Variation vs Drain Current and Gate Voltage

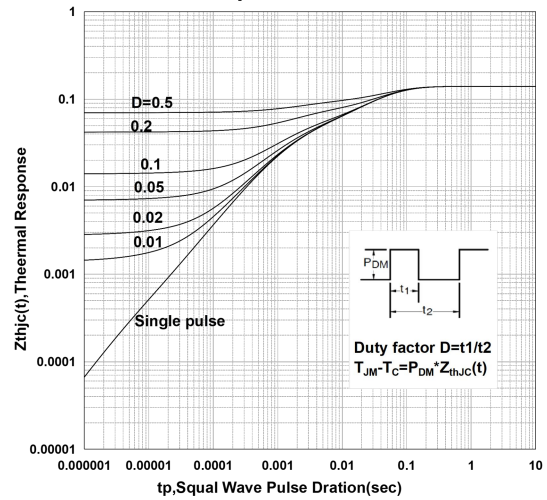




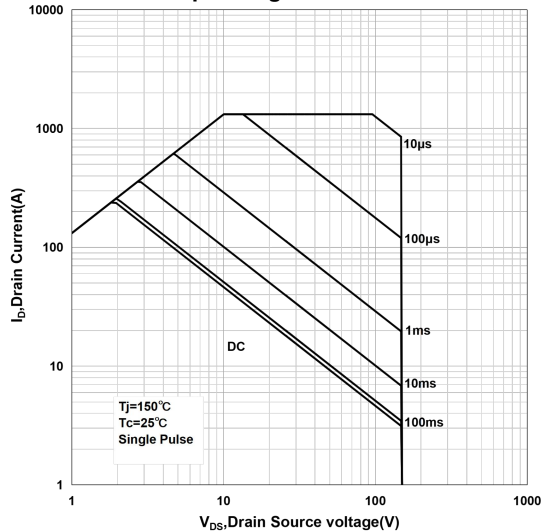
Safe Operating Area for SOT-227



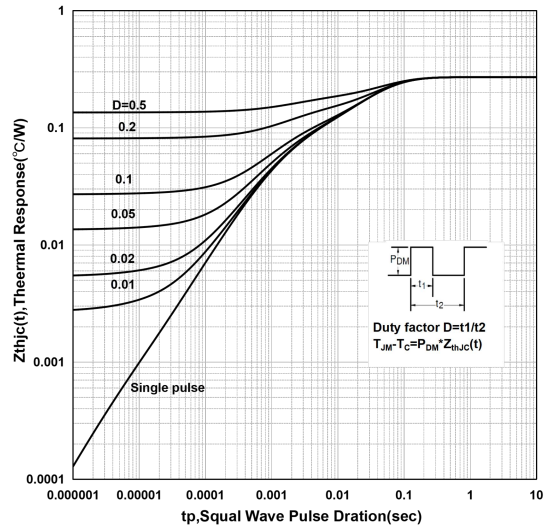
Transient response Curve for SOT-227



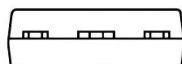
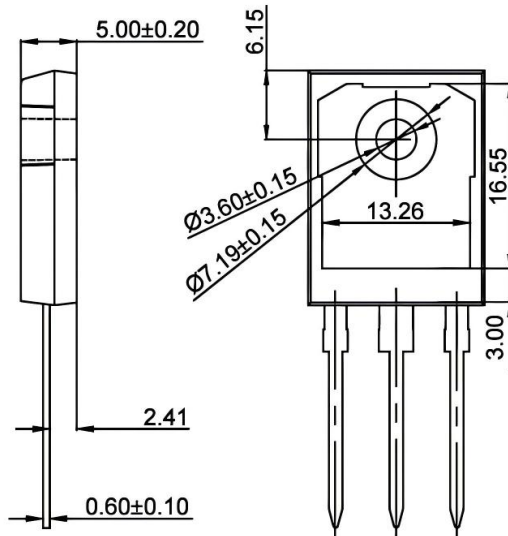
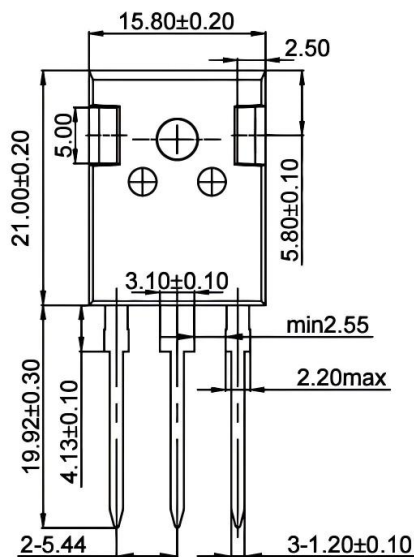
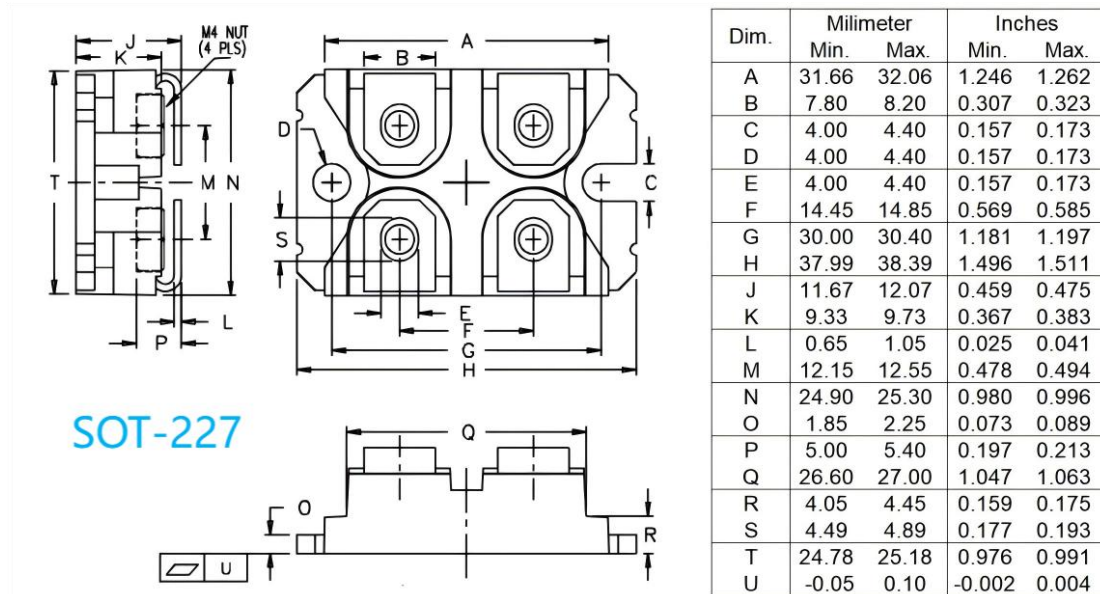
Safe Operating Area for TO-247



Transient Response Curve for TO-247



Package Mechanical DATA



NOTES: 1. surface roughness $R_a = 1.14 \pm 0.20 \mu m$
 2. Unmarked tolerance ± 0.15
 3. unit: mm