V_{DSS}	60 V
I_D	65 A
$R_{DS(ON)}$	16mΩ

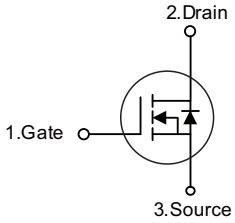
FEATURES

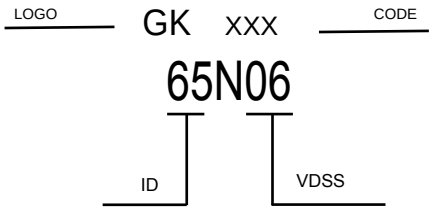
- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Special process technology for high ESD capability
- Plane technology



APPLICATION

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply





MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Maximum ratings (T_a=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current	I_D	65	A
Pulsed Drain Current	I_{DM}	240	
Single Pulsed Avalanche Energy*	E_{AS}		
Power Dissipation	P_D	120	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62.5	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{stg}	-50 ~+150	

*E_{AS} condition: T_j=25℃,V_{DD}=60V,L=0.5mH, R_G=25Ω, Starting T_J = 25°C

Electrical characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)\ DSS}$	V_{GS} = 0V, I_D =250μA	60			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =60V, V_{GS} =0V			1	μA
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±20V			±100	nA
On characteristics (note1)						
Gate-threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D=250uA	2.0		3.0	V
Static drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =20A		16	23	mΩ
Forward transconductance	g_{FS}	V_{DS} =25V, I_D =20A	17			S
Dynamic characteristics (note 2)						
Input capacitance	C_{iss}	V_{DS} =25V,V_{GS} =0V, f =1MHz		1500		pF
Output capacitance	C_{oss}			300		
Reverse transfer capacitance	C_{rss}			90		
Switching characteristics (note 2)						
Total gate charge	Q_g	V_{DS}=30V, V_{GS}=10V, I_D=60A		30		nC
Gate-source charge	Q_{gs}			10		
Gate-drain charge	Q_{gd}			11		
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V,I_D=2A, V_{GS}=10V,R_G=2.5Ω, R_L=15Ω		22		ns
Turn-on rise time	t_r			70		
Turn-off delay time	$t_{d(off)}$			70		
Turn-off fall time	t_f			35		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage(note1)	V_{SD}	V_{GS} =0V, I_S=40A			1.3	V
Continuous drain-source diode forward current	I_S				60	A
Pulsed drain-source diode forward current	I_{SM}				240	A

Notes:

1. Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.
2. Guaranteed by design, not subject to production.

RATING AND CHARACTERISTIC CURVES

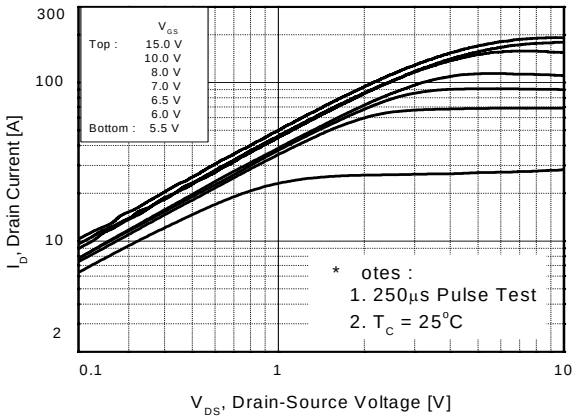


Figure 1. On-Region Characteristics

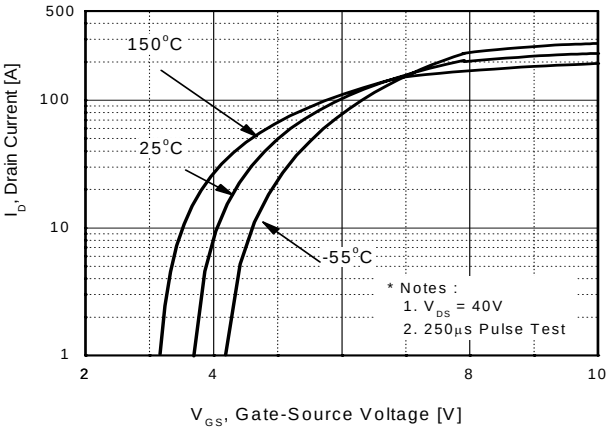


Figure 2. Transfer Characteristics

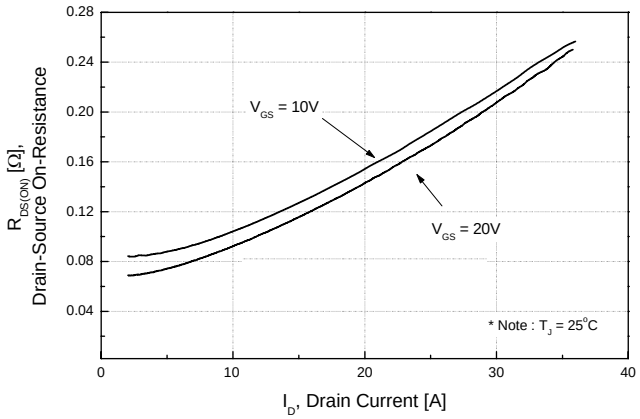


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

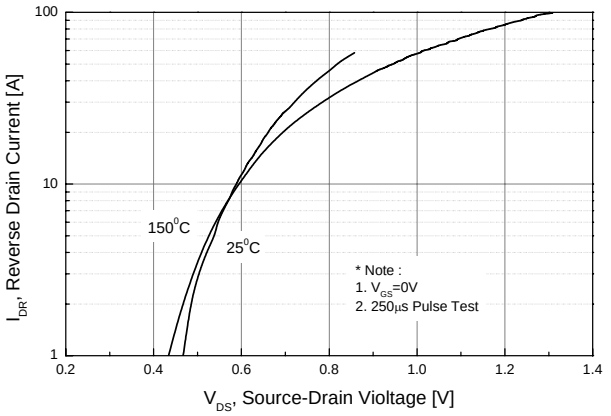


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperatue

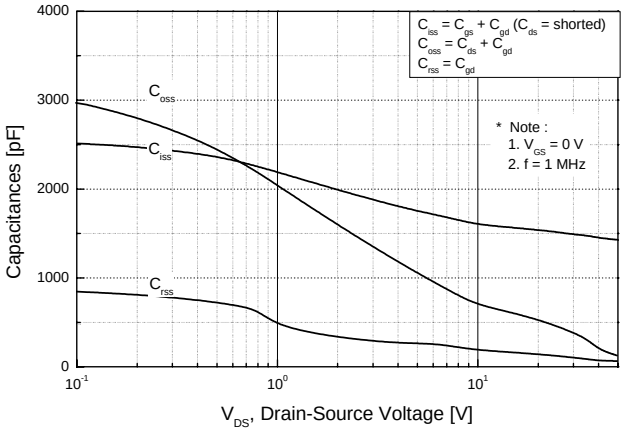


Figure 5. Capacitance Characteristics

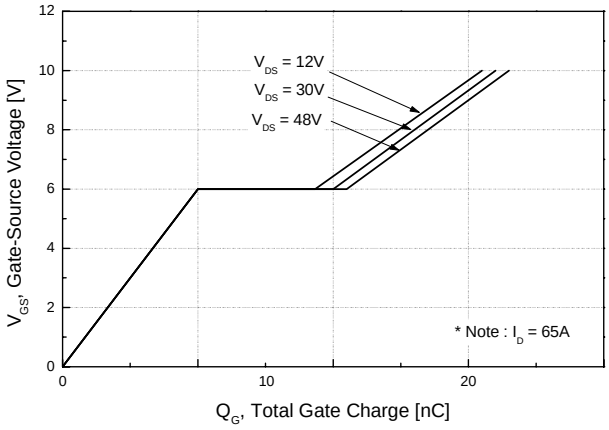


Figure 6. Gate Charge Characteristics

RATING AND CHARACTERISTIC CURVES

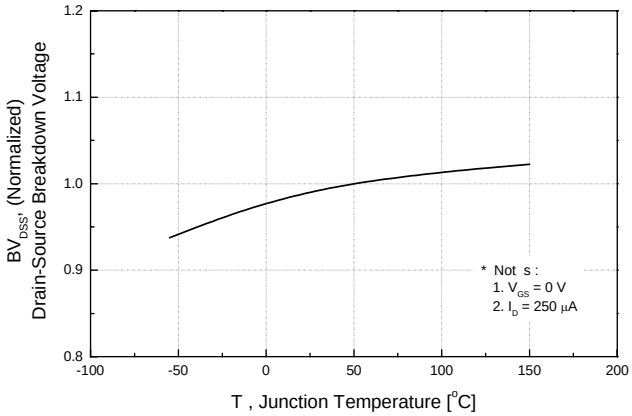


Figure 7. Breakdown Voltage Variation vs. Temperature

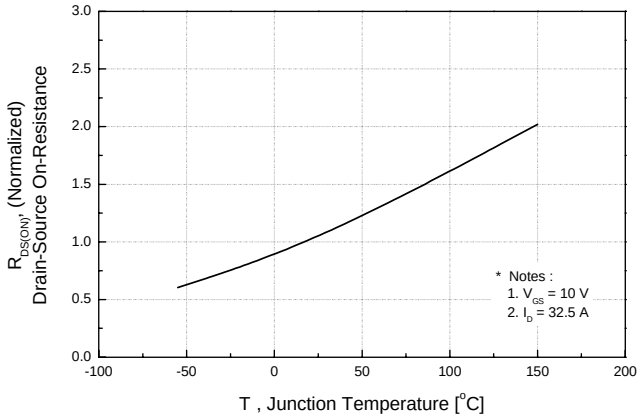


Figure 8. On-Resistance Variation vs. Temperature

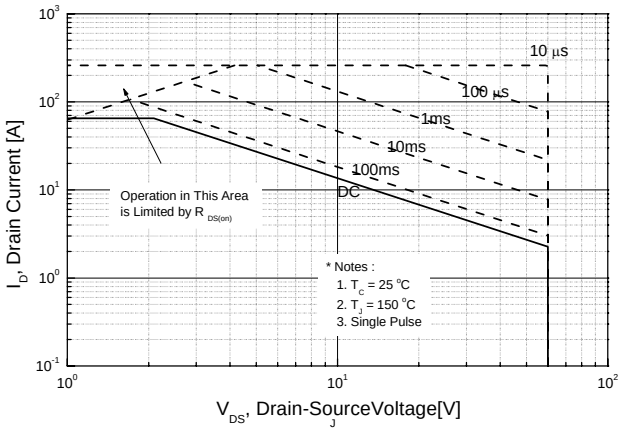


Figure 9. Maximum Safe Operating Area

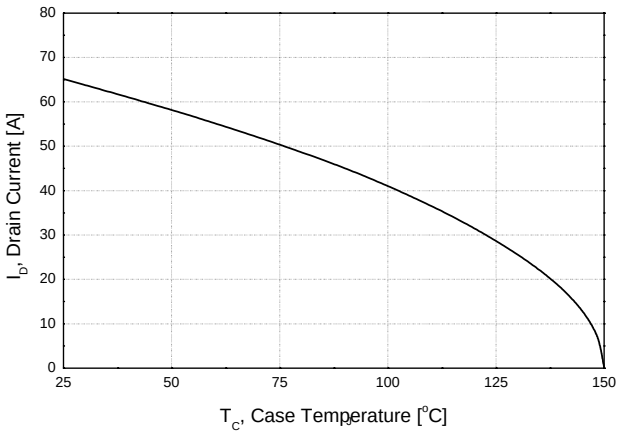


Figure 10. Maximum Drain Current vs. Case Temperature

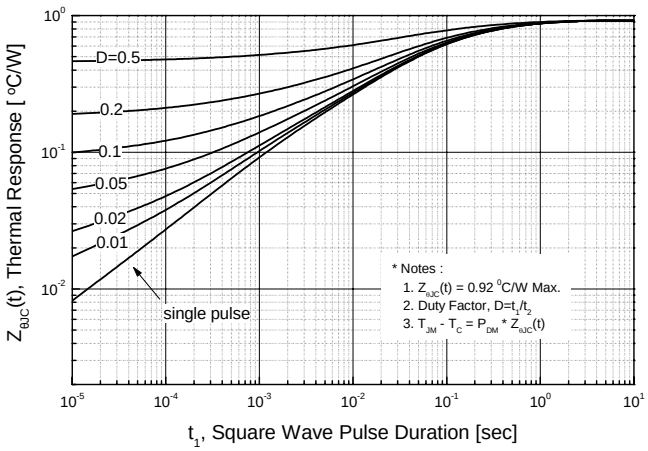


Figure 11. Transient Thermal Response Curve

TEST CIRCUIT

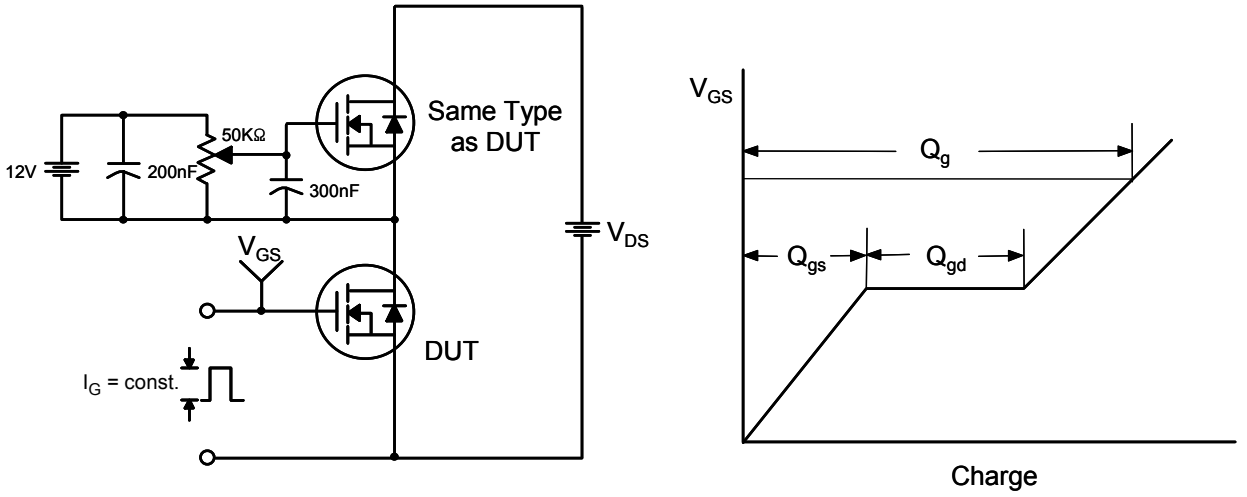


Figure 12. Gate Charge Test Circuit & Waveform

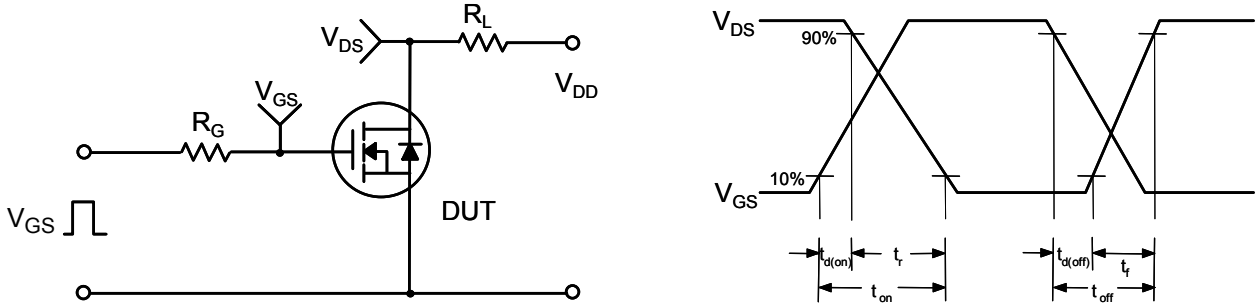


Figure 13. Resistive Switching Test Circuit & Waveforms

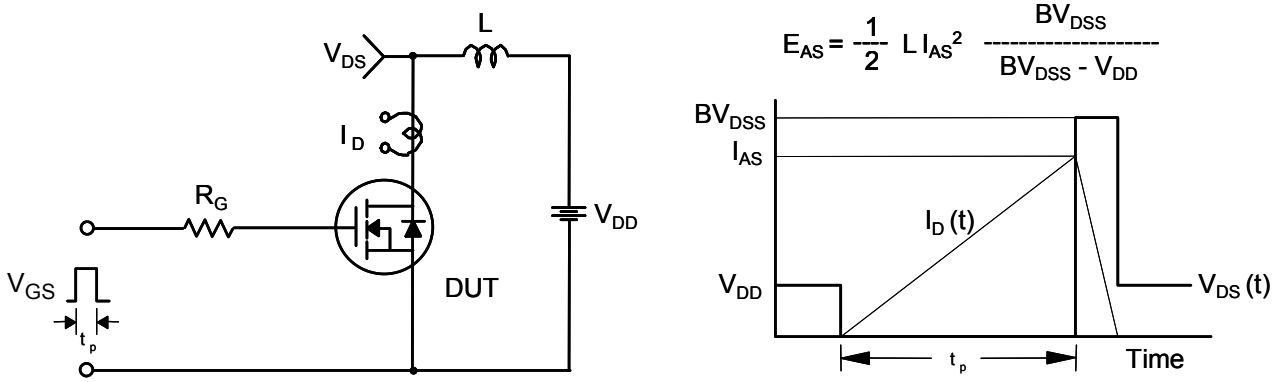


Figure 14. Unclamped Inductive Switching Test Circuit & Waveforms

TEST CIRCUIT

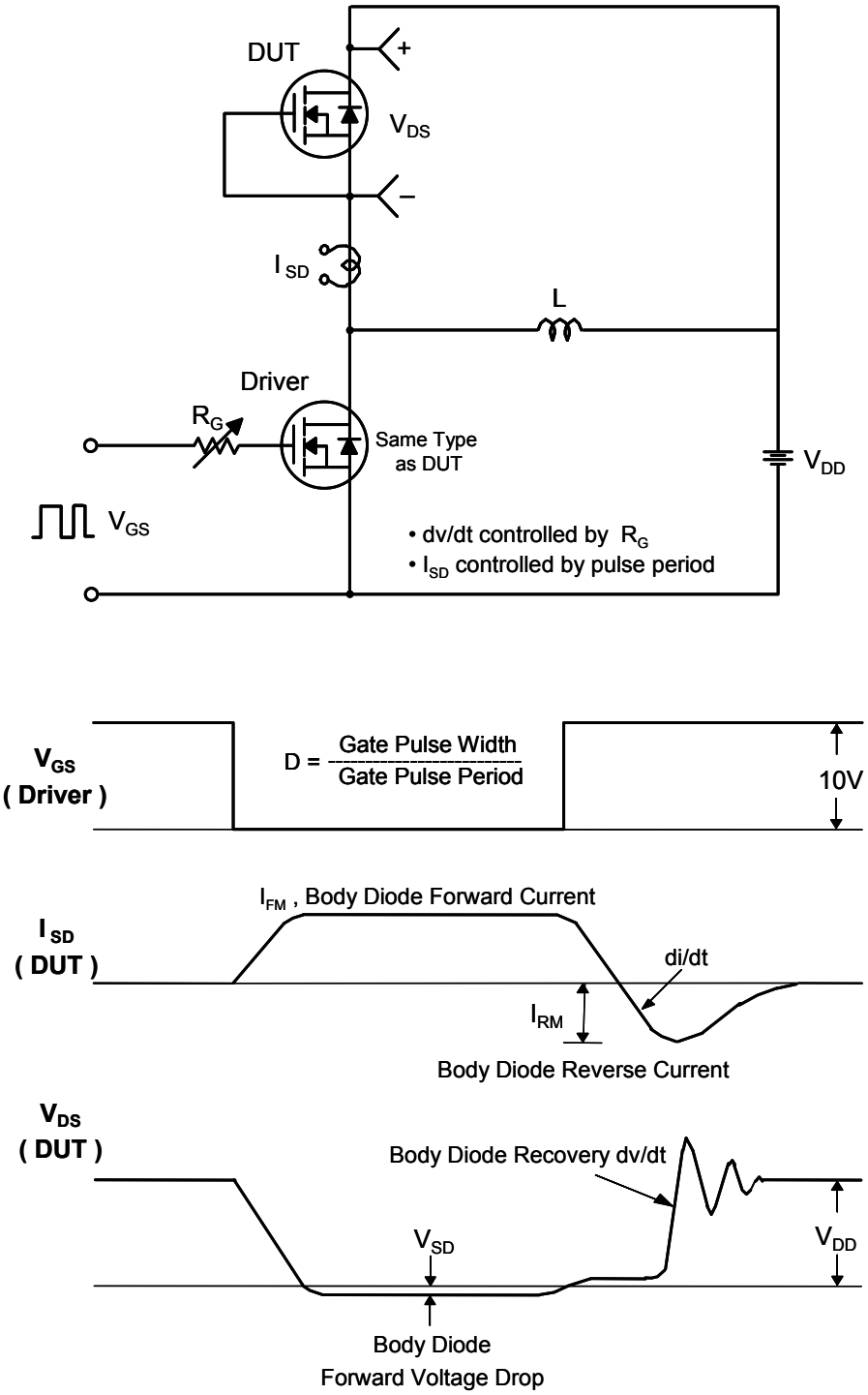
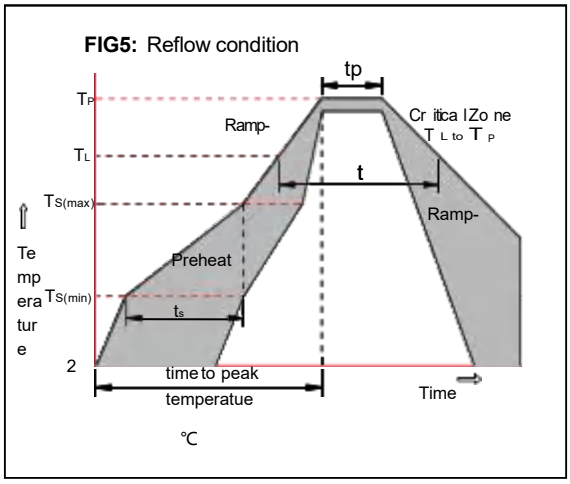


Figure 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms

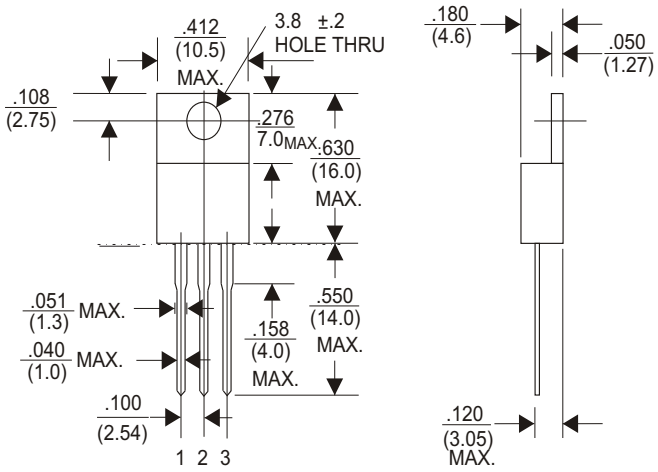
Soldering parameters

Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃



Package Dimensions & Suggested Pad Layout

TO-220



Dimensions in inches and (millimeters)

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