HGB009NE6A P-1

65V N-Ch Power MOSFET

Feature

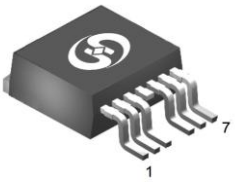
◇ High Speed Power Smooth Switching
◇ Enhanced Body diode dv/dt capability
◇ Enhanced Avalanche Ruggedness
◇ 100% UIS Tested, 100% Rg Tested
◇ Lead Free

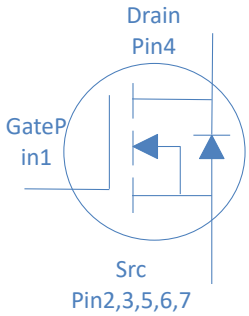
V_{DS}	65	V
$R_{DS(on),typ}$	0.78	mΩ
$I_{D\ (Sillicon\ Limited)}$	506	A
$I_{D\ (Package\ Limited)}$	240	A

Application

◇ Synchronous Rectification in SMPS
◇ Hard Switching and High Speed Circuit
◇ Power Tools
◇ UPS
◇ Motor Control

TO-263-7





Part Number	Package	Marking
HGB009NE6A	TO-263	GB009NE6A

Absolute Maximum Ratings at T_j=25℃ (unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current (Silicon Limited)	I_D	T_C=25℃	506	A
		T_C=100℃	358	
Continuous Drain Current (Package Limited)		T_C=25℃	240	
Drain to Source Voltage	V_{DS}	-	65	V
Gate to Source Voltage	V_{GS}	-	±20	V
Pulsed Drain Current	I_{DM}	-	1950	A
Avalanche Energy, Single Pulse	E_{AS}	L=0.4mH, T_C=25℃	720	mJ
Power Dissipation	P_D	T_C=25℃	429	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to175	℃

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.35	℃/W
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	60	℃/W

Electrical Characteristics at T_j=25℃ (unless otherwise specified)

Static Characteristics

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	65	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250μA	2	2.6	4	
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V, V_{DS}=60V, T_j=25℃	-	-	1	μA
		V_{GS}=0V, V_{DS}=60V, T_j=100℃	-	-	100	
Gate to Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
Drain to Source on Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=20A	-	0.78	0.95	mΩ
Transconductance	g_{fs}	V_{DS}=5V, I_D=20A	-	85	-	S
Gate Resistance	R_G	V_{GS}=0V, V_{DS} Open, f=1MHz	-	0.7	-	Ω

Dynamic Characteristics

Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=30V, f=1MHz	-	18330	-	pF
Output Capacitance	C_{oss}		-	6011	-	
Reverse Transfer Capacitance	C_{rss}		-	347	-	
Total Gate Charge	Q_g	V_{DD}=30V, I_D=20A, V_{GS}=10V	-	280	-	nC
Gate to Source Charge	Q_{gs}		-	58	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	60	-	
Turn on Delay Time	$t_{d(on)}$	V_{DD}=30V, I_D=20A, V_{GS}=10V, R_G=10Ω,	-	34	-	ns
Rise time	t_r		-	32	-	
Turn off Delay Time	$t_{d(off)}$		-	74	-	
Fall Time	t_f		-	26	-	

Reverse Diode Characteristics

Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_F=20A	-	0.9	-	V
Reverse Recovery Time	t_{rr}	V_R=30V, I_F=20A, dI_F/dt=100A/μs	-	102	-	ns
Reverse Recovery Charge	Q_{rr}		-	213	-	nC

Fig 1. Typical Output Characteristics

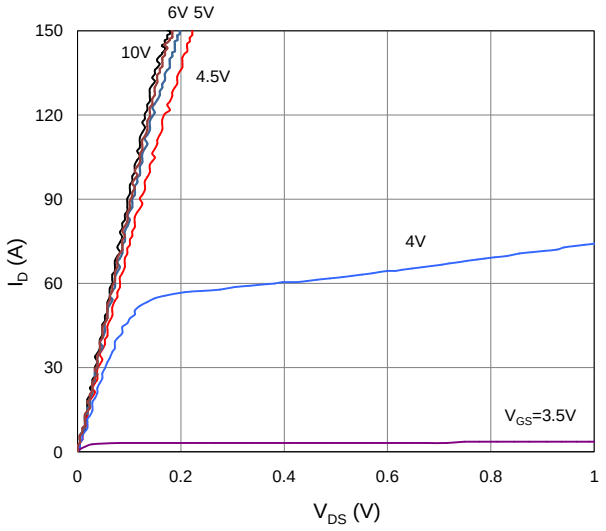


Figure 2. On-Resistance vs. Gate-Source Voltage

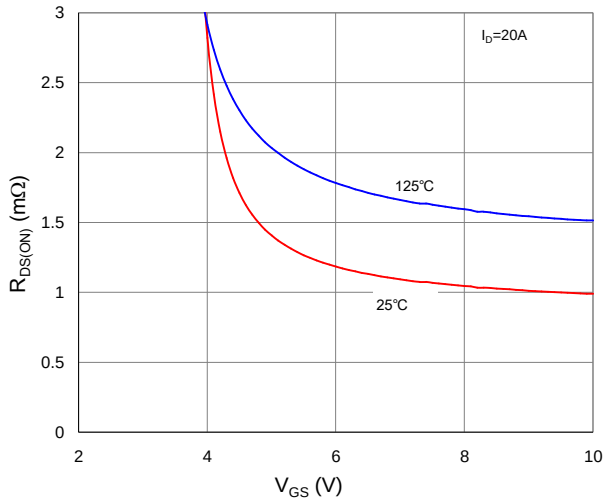


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

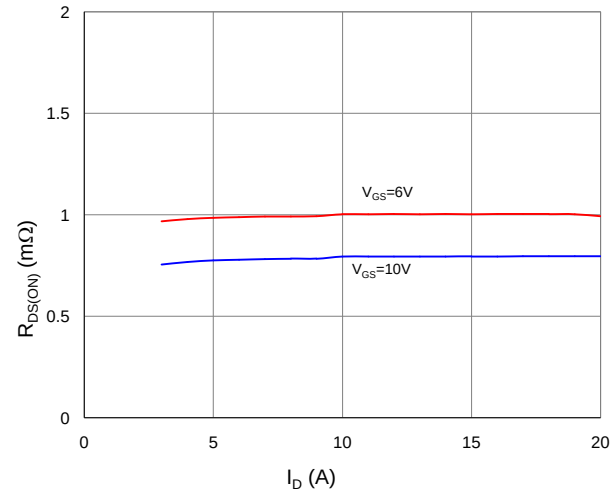


Figure 4. Normalized On-Resistance vs. Junction Temperature

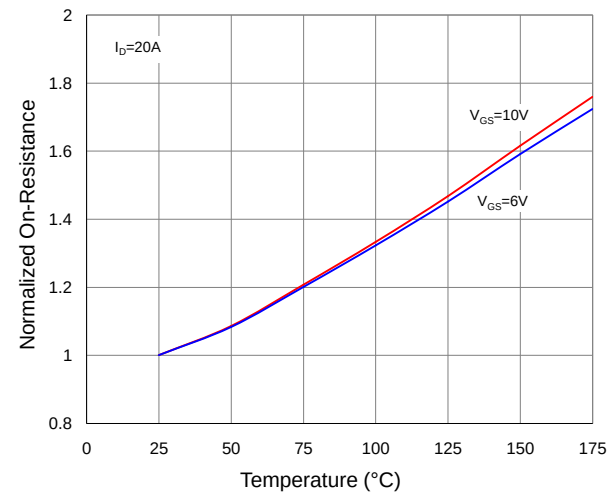


Figure 5. Typical Transfer Characteristics

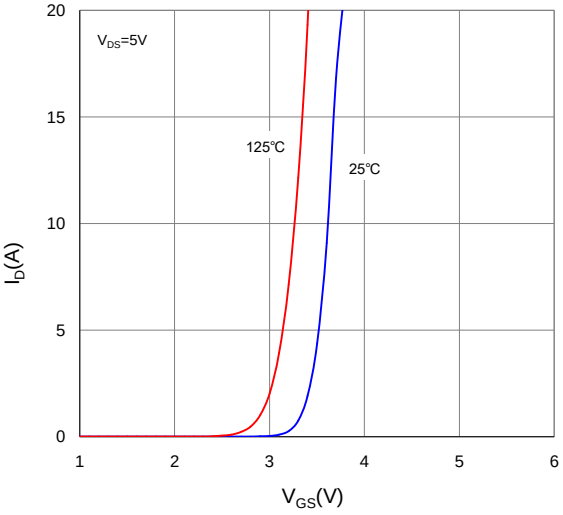


Figure 6. Typical Source-Drain Diode Forward Voltage

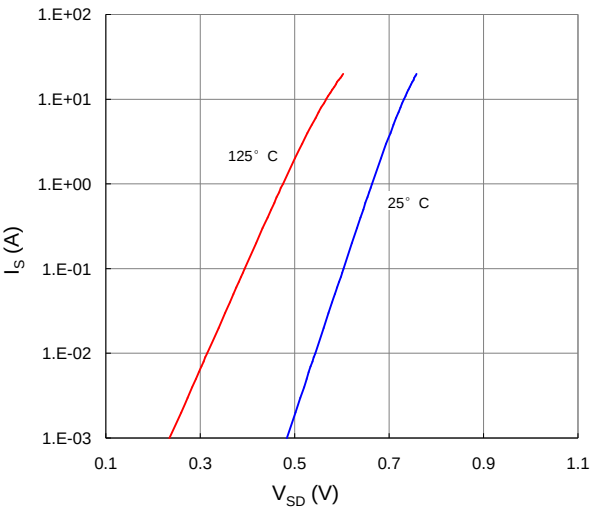


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

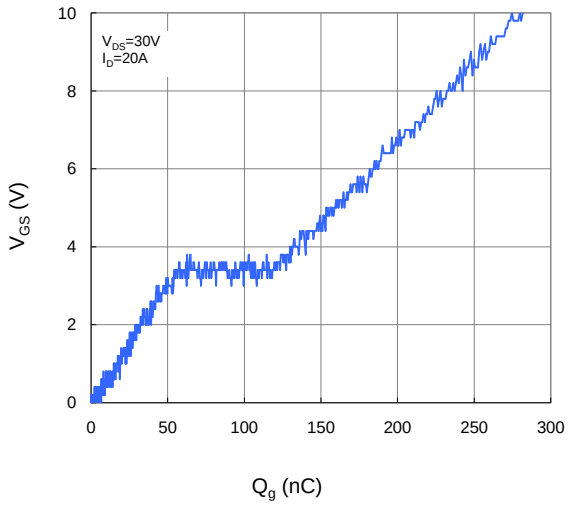


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

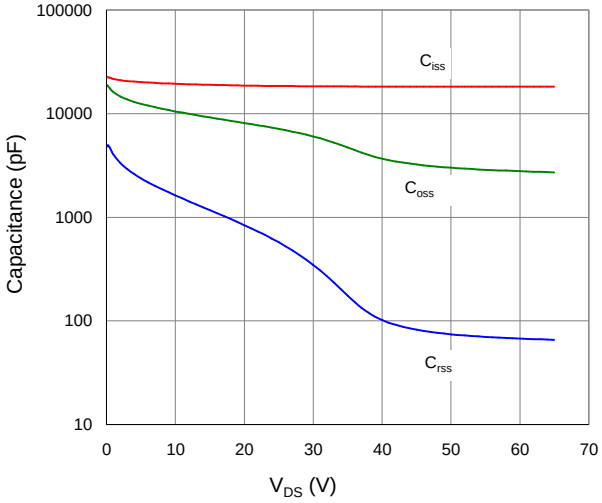


Figure 9. Maximum Safe Operating Area

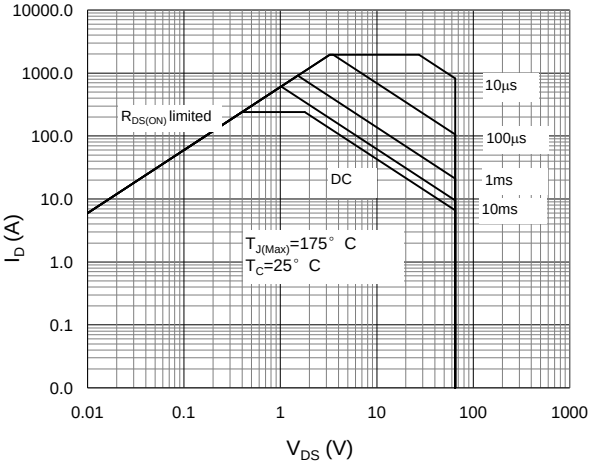


Figure 10. Maximun Drain Current vs. Case Temperature

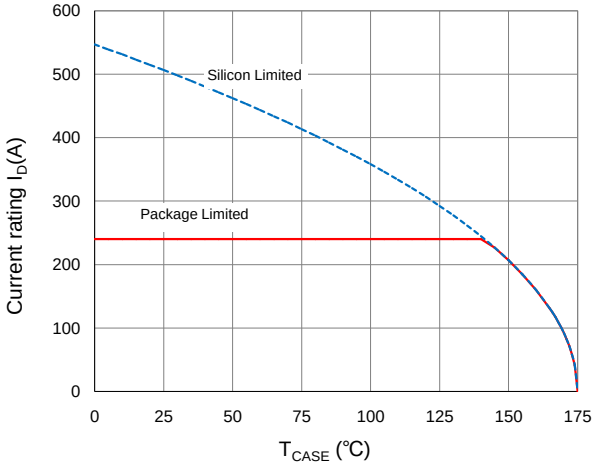
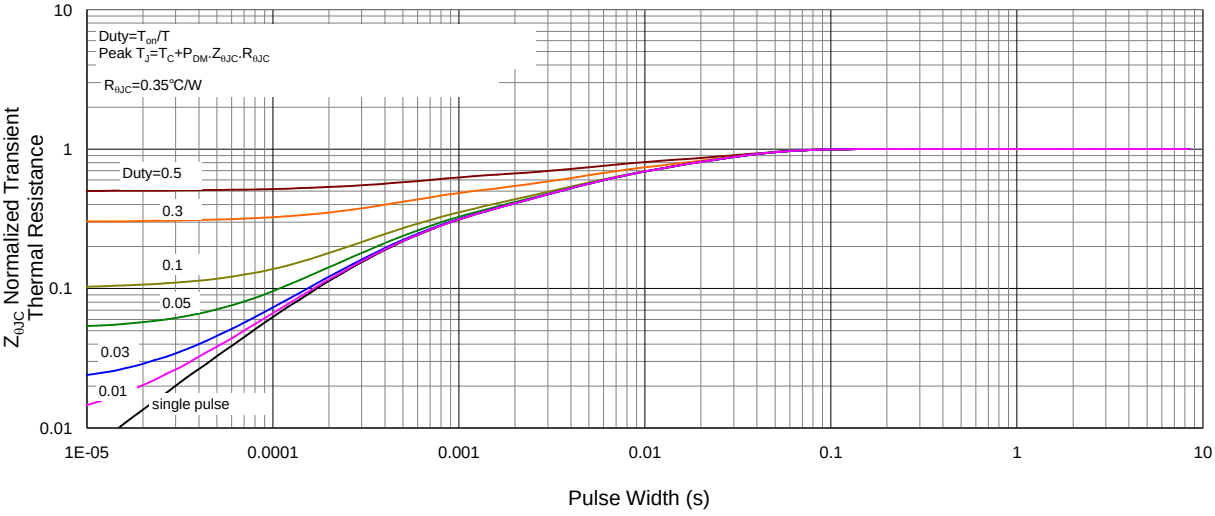
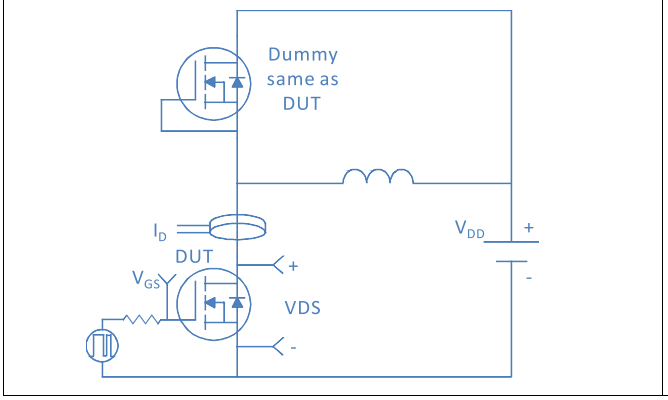
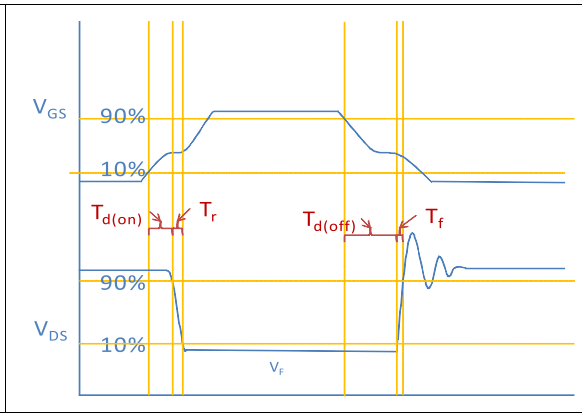


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

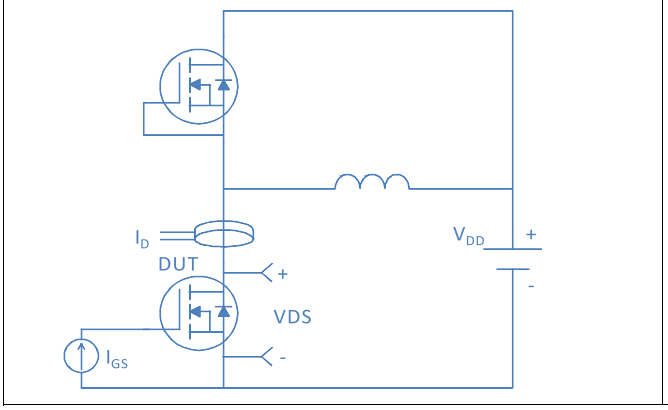


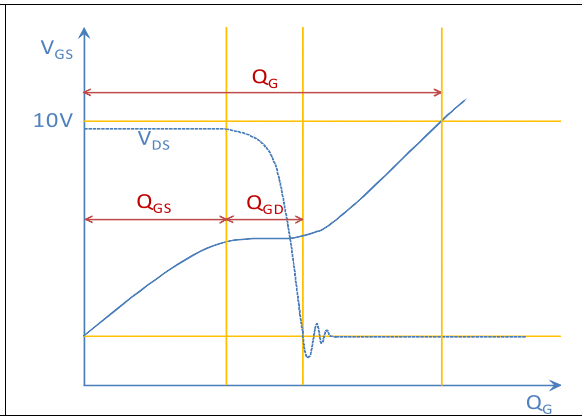
Inductive switching Test



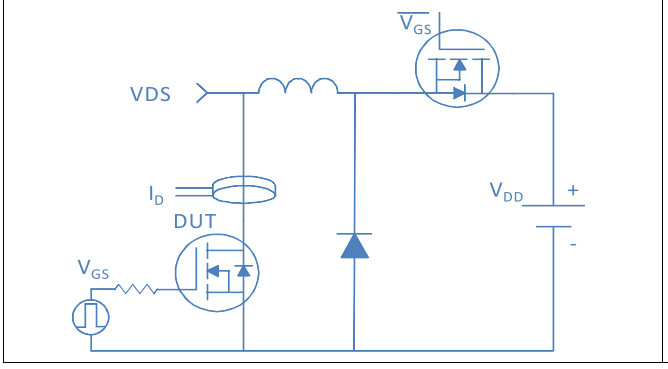


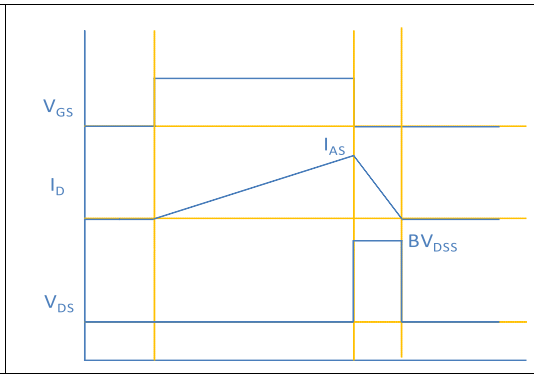
Gate Charge Test



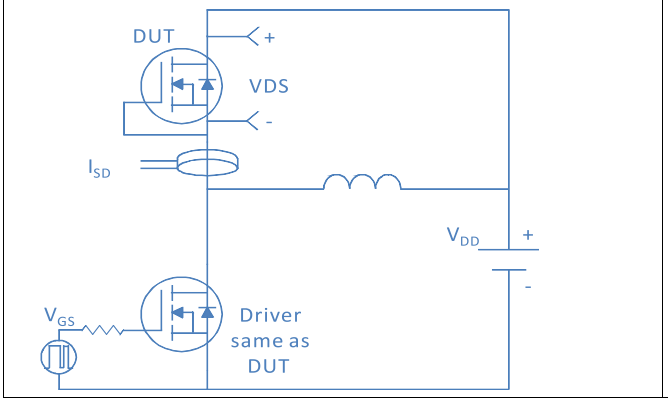


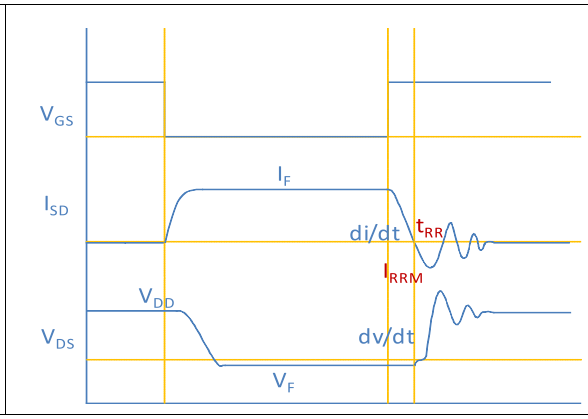
Uclamped Inductive Switching (UIS) Test



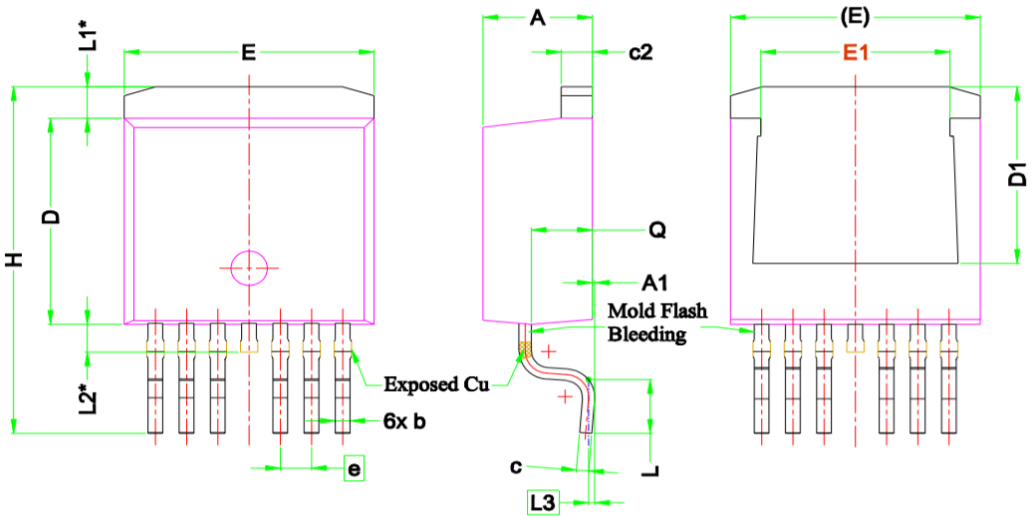


Diode Recovery Test





TO-263-7, 7 leads



SYMBOL	DIMENSIONS		
	MIN.	NOM.	MAX.
A	4.24	4.44	4.64
A1	0.00	0.10	0.25
b	0.50	0.60	0.70
c	0.40	0.50	0.60
c2	1.15	1.27	1.40
D	8.82	8.92	9.02
D1	6.86	7.65	---
E	9.96	10.16	10.36
E1	6.89	7.77	7.89
e	1.27 BSC		
H	14.61	15.00	15.88
L	1.78	2.32	2.79
L1	1.36 REF.		
L2	1.20 REF.		
L3	0.25 BSC		
Q	2.30	2.48	2.70