

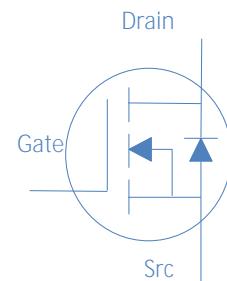
120V N-Ch Power MOSFET

Feature

High Speed Power Switching, Logic Level
 Enhanced Body diode dv/dt capability
 Enhanced Avalanche Ruggedness
 100% UIS Tested, 100% R_g Tested

Lead Free,T_{case} 62.5°C reWnBT/F42168f1 00161265333 Tm0 g9f1 00161265333 Tm0 g0 G

V_{DS}	120	V
$R_{DS(on),typ}$	$V_{GS}=10V$	9.8 m
$R_{DS(on),typ}$	$V_{GS}=4.5V$	12.0 m
I_D (Silicon Limited)	68	A



Part Number	Package	Marking
HGI130N12SL	TO-251	GI130N12SL
HGD130N12SL	TO-252	GD130N12SL

Absolute Maximum Ratings at T_J

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current (Silicon Limited)	I_D	T_C	68	A
		T_C	48	
Drain to Source Voltage	V_{DS}	-	120	V
Gate to Source Voltage	V_{GS}	-	20	V
Pulsed Drain Current	I_{DM}	-	260	A
Avalanche Energy, Single Pulse	E_{AS}	$L=0.4mH, T_C$	320	mJ
Power Dissipation	P_D	T_C	136	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to 175	

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Ambient	R_{JA}	50	
Thermal Resistance Junction-Case	R_{JC}	1.1	

Electrical Characteristics at T_J

Static Characteristics

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\text{ A}$	120	-	-	V
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{GS}=V_{DS}, I_D=250\text{ A}$	1.4	2.0	2.4	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS}=0V, V_{DS}=120V, T_J$	-	-	1	A
		$V_{GS}=0V, V_{DS}=120V, T_J$	-	-	100	
Gate to Source Leakage Current	I_{GSS}	$V_{GS} \leq 99, V_{DS}=0V$	-	-	100	nA
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$	-	9.8	12.5	m
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=20A$	-	12	17	m
Transconductance	g_{fs}	$V_{DS}=5V, I_D=20A$	-	65	-	S
Gate Resistance	R_G	$V_{GS}=0V, V_{DS} \text{ Open}, f=1MHz$	-	2.2	-	

Dynamic Characteristics

Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=60V, f=1MHz$	-	2056	-	pF
Output Capacitance	C_{oss}		-	222	-	
Reverse Transfer Capacitance	C_{rss}		-	7.9	-	
Total Gate Charge	$Q_g(10V)$	$V_{DD}=60V, I_D=20A, V_{GS}=10V$	-	31	-	nC
Total Gate Charge	$Q_g(4.5V)$		-	15	-	
Gate to Source Charge	Q_{gs}		-	8	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	4	-	
Turn on Delay Time	$t_{d(on)}$		-	11	-	ns
Rise time	t_r	$V_{DD}=60V, I_D=20A, V_{GS}=10V, R_G=10\Omega$	-	9	-	
Turn off Delay Time	$t_{d(off)}$		-	18	-	
Fall Time	t_f		-	10	-	

Reverse Diode Characteristics

Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_F=20A$	-	0.9	1.2	V
Reverse Recovery Time	t_{rr}	$V_R=60V, I_F=20A, dI_F/dt=100A/\text{s}$	-	50	-	ns
Reverse Recovery Charge	Q_{rr}		-	75	-	nC

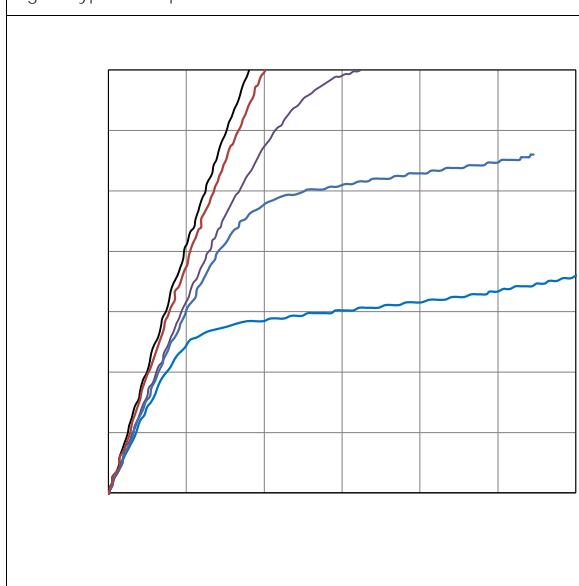
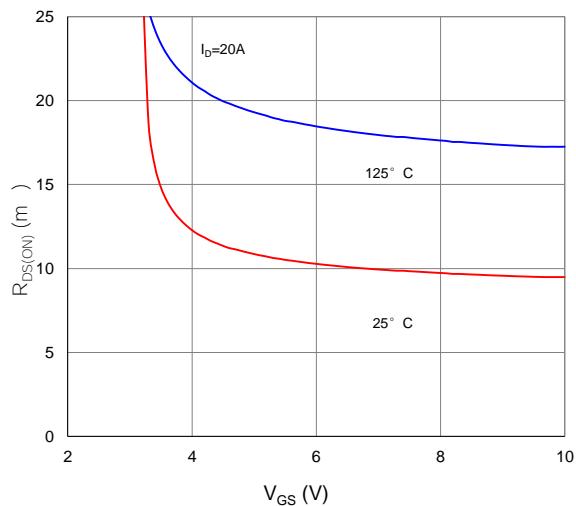
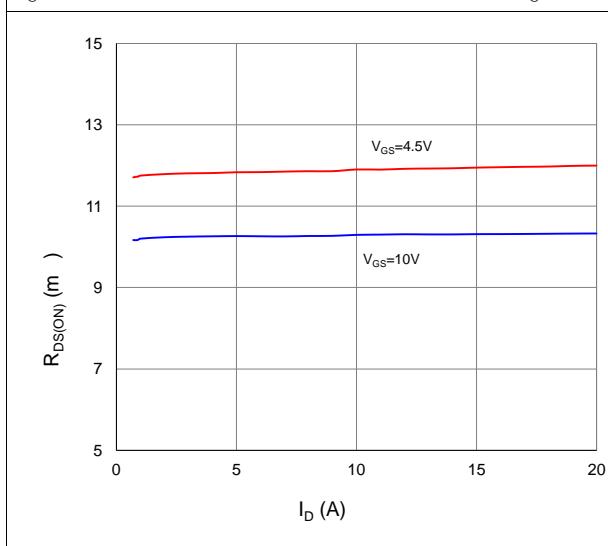
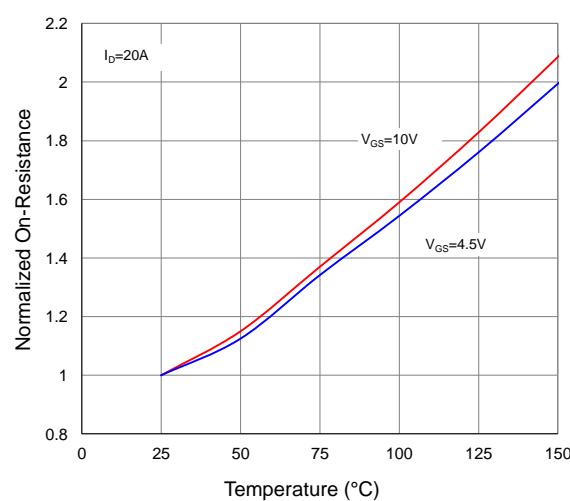
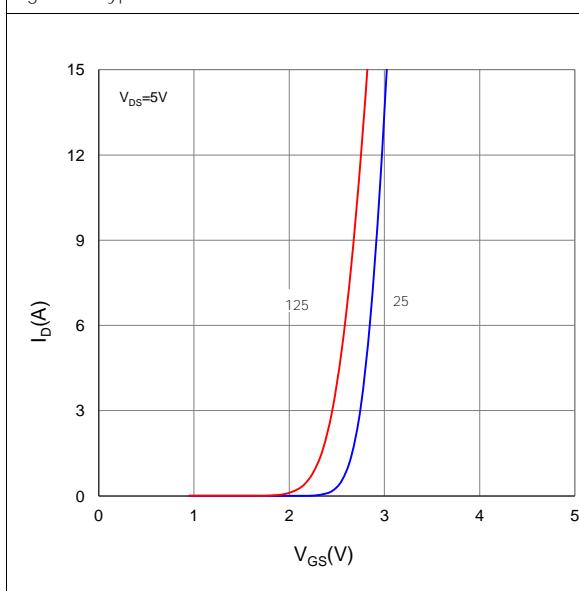
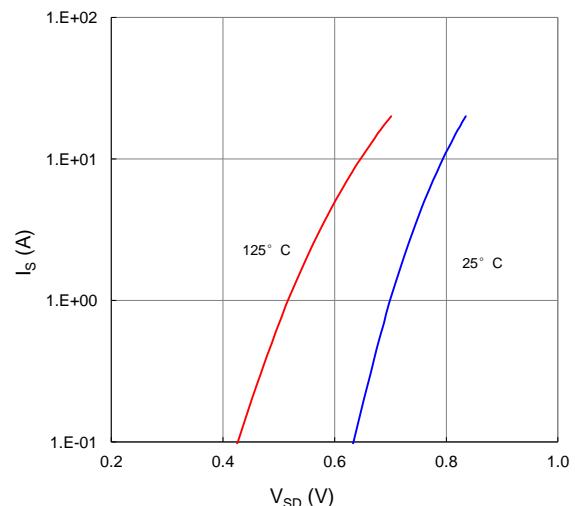
Fig 1. Typical Output Characteristics

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

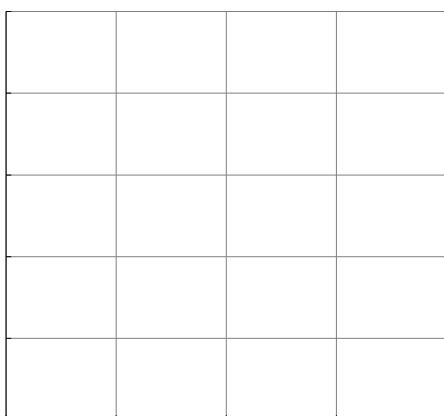
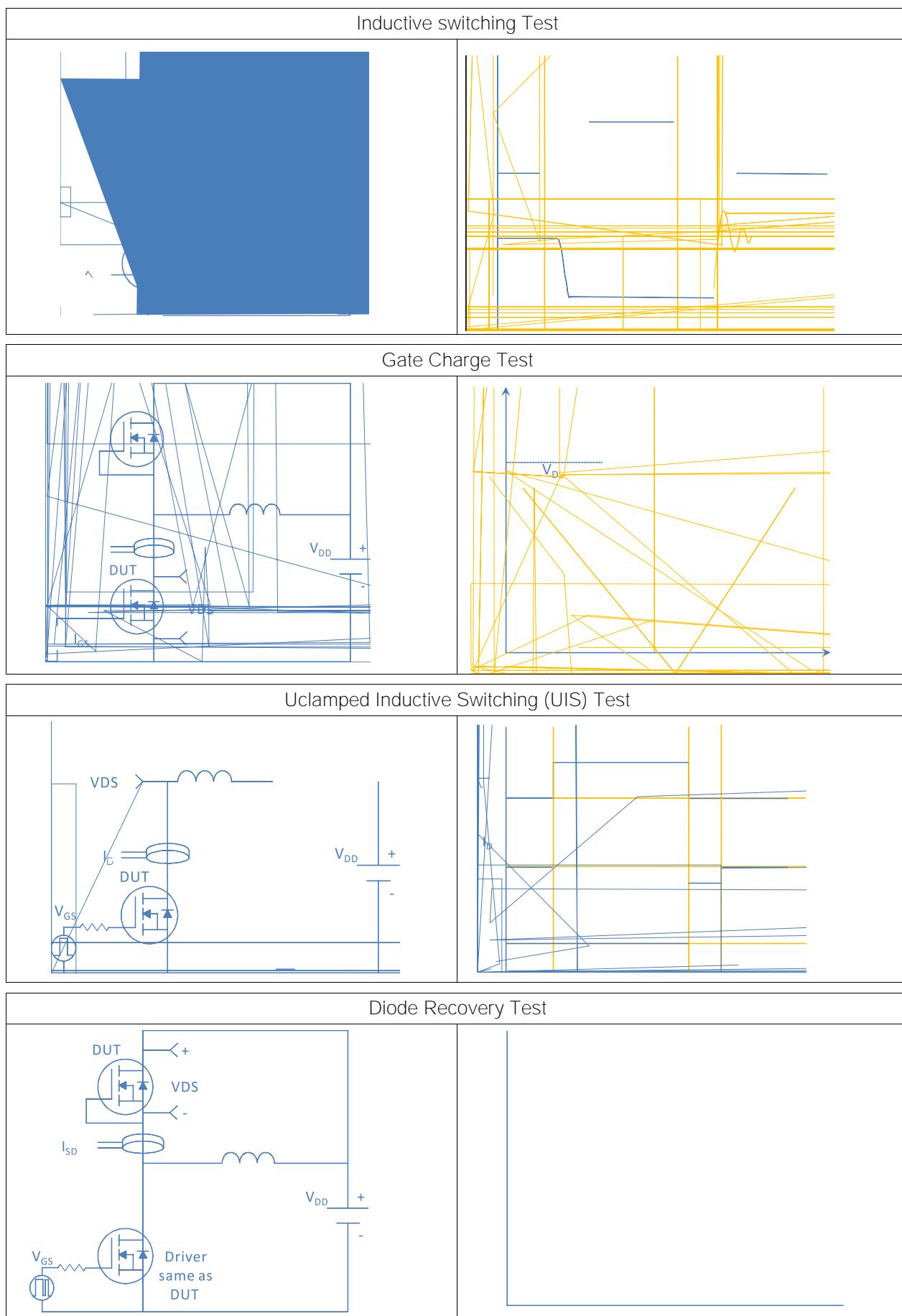
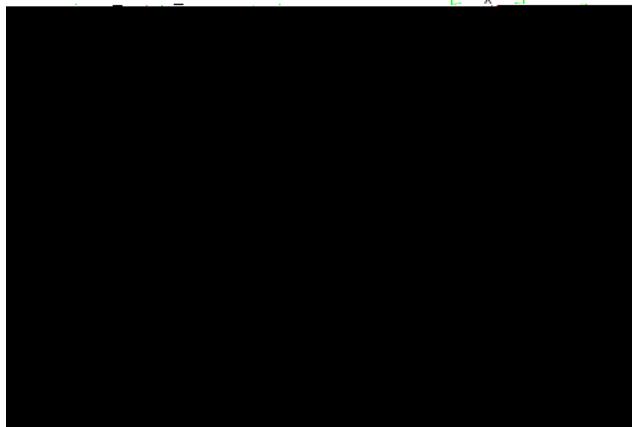


Figure 9. Maximum Safe Operating Area

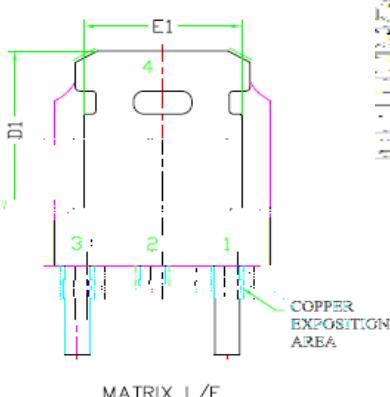
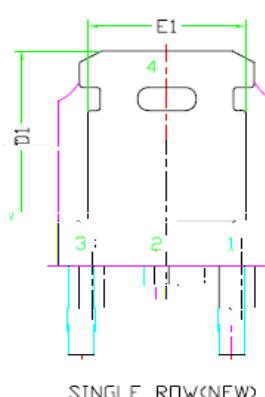
Figure 10. Maximum Drain Current vs. Case Temperature

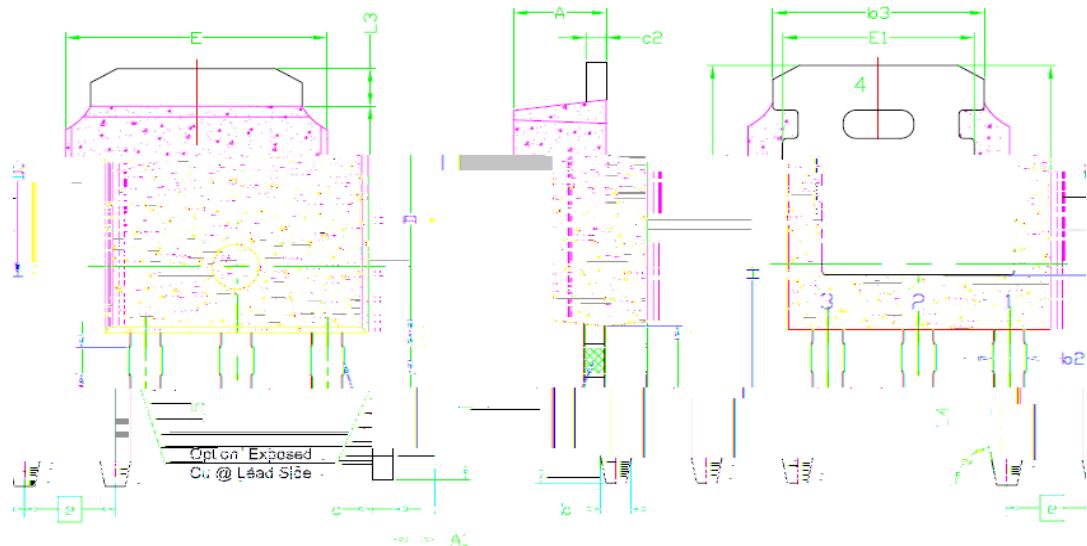
Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient



Package Outline
TO-252, 2 Leads


SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
E	6.40	6.60	6.731
L	1.40	1.52	1.77
L1	2.743	REF	
L2	0.508	BSC	
L3	0.89	--	1.27
L4	0.64	--	1.01
L5	--	--	--
D	6.00	6.10	6.223
A1	0.40	0.40	0.40
A2	0.30	0.30	0.30
A3	0.22	0.22	0.22
A4	0.21	0.21	0.21
A5	0.20	0.20	0.20
A6	0.20	0.20	0.20
A7	0.20	0.20	0.20
A8	0.20	0.20	0.20
A9	0.20	0.20	0.20
A10	0.20	0.20	0.20
A11	0.20	0.20	0.20
A12	0.20	0.20	0.20
A13	0.20	0.20	0.20
A14	0.20	0.20	0.20
A15	0.20	0.20	0.20
A16	0.20	0.20	0.20
A17	0.20	0.20	0.20
A18	0.20	0.20	0.20
A19	0.20	0.20	0.20
A20	0.20	0.20	0.20
A21	0.20	0.20	0.20
A22	0.20	0.20	0.20
A23	0.20	0.20	0.20
A24	0.20	0.20	0.20
A25	0.20	0.20	0.20
A26	0.20	0.20	0.20
A27	0.20	0.20	0.20
A28	0.20	0.20	0.20
A29	0.20	0.20	0.20
A30	0.20	0.20	0.20
A31	0.20	0.20	0.20
A32	0.20	0.20	0.20
A33	0.20	0.20	0.20
A34	0.20	0.20	0.20
A35	0.20	0.20	0.20
A36	0.20	0.20	0.20
A37	0.20	0.20	0.20
A38	0.20	0.20	0.20
A39	0.20	0.20	0.20
A40	0.20	0.20	0.20
A41	0.20	0.20	0.20
A42	0.20	0.20	0.20
A43	0.20	0.20	0.20
A44	0.20	0.20	0.20
A45	0.20	0.20	0.20
A46	0.20	0.20	0.20
A47	0.20	0.20	0.20
A48	0.20	0.20	0.20
A49	0.20	0.20	0.20
A50	0.20	0.20	0.20
A51	0.20	0.20	0.20
A52	0.20	0.20	0.20
A53	0.20	0.20	0.20
A54	0.20	0.20	0.20
A55	0.20	0.20	0.20
A56	0.20	0.20	0.20
A57	0.20	0.20	0.20
A58	0.20	0.20	0.20
A59	0.20	0.20	0.20
A60	0.20	0.20	0.20
A61	0.20	0.20	0.20
A62	0.20	0.20	0.20
A63	0.20	0.20	0.20
A64	0.20	0.20	0.20
A65	0.20	0.20	0.20
A66	0.20	0.20	0.20
A67	0.20	0.20	0.20
A68	0.20	0.20	0.20
A69	0.20	0.20	0.20
A70	0.20	0.20	0.20
A71	0.20	0.20	0.20
A72	0.20	0.20	0.20
A73	0.20	0.20	0.20
A74	0.20	0.20	0.20
A75	0.20	0.20	0.20
A76	0.20	0.20	0.20
A77	0.20	0.20	0.20
A78	0.20	0.20	0.20
A79	0.20	0.20	0.20
A80	0.20	0.20	0.20
A81	0.20	0.20	0.20
A82	0.20	0.20	0.20
A83	0.20	0.20	0.20
A84	0.20	0.20	0.20
A85	0.20	0.20	0.20
A86	0.20	0.20	0.20
A87	0.20	0.20	0.20
A88	0.20	0.20	0.20
A89	0.20	0.20	0.20
A90	0.20	0.20	0.20
A91	0.20	0.20	0.20
A92	0.20	0.20	0.20
A93	0.20	0.20	0.20
A94	0.20	0.20	0.20
A95	0.20	0.20	0.20
A96	0.20	0.20	0.20
A97	0.20	0.20	0.20
A98	0.20	0.20	0.20
A99	0.20	0.20	0.20
A100	0.20	0.20	0.20



Package Outline
TO-251, 3 leads


SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
E	6.40	6.60	6.731
L	3.98	4.13	4.28
L3	0.89	--	1.27
L4	0.698 REF		
L5	0.972	1.099	1.226
D	6.00	6.10	6.223
H	11.05	11.25	11.45
b	0.64	0.76	0.88
b2	0.77	0.84	1.14
b3	5.21	5.34	5.46
e	2.286 BSC		
A	2.20	2.30	2.38
A1	0.89	1.04	1.15
c	0.46	0.50	0.60
c2	0.46	0.50	0.60
D1	5.10	--	--
E1	4.40	--	--
α	79° REF		