

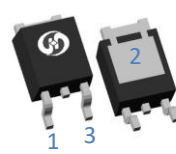
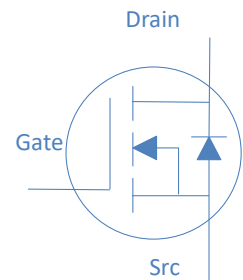
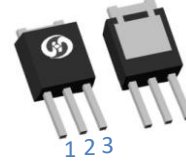
100V N-Ch Power MOSFET
Feature

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

V_{DS}		100	V
$R_{DS(on),typ}$	$V_{GS}=10V$	21.5	mΩ
$R_{DS(on),typ}$	$V_{GS}=4.5V$	28	mΩ
I_D (Silicon Limited)		31	A
I_D (Package Limited)		24	A

Application

- ◇ Synchronous Rectification in SMPS
- ◇ Hard Switching and High Speed Circuit
- ◇ DC/DC in Telecoms and Industrial

TO-252

TO-251


Part Number	Package	Marking
HGD230N10AL	TO-252	GD230N10AL
HGI230N10AL	TO-251	GI230N10AL

Absolute Maximum Ratings at $T_j=25^{\circ}C$ (unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current (Silicon Limited)	I_D	$T_C=25^{\circ}C$	31	A
		$T_C=100^{\circ}C$	22	
		$T_C=25^{\circ}C$	24	
Continuous Drain Current (Package Limited)		$T_C=25^{\circ}C$	24	
Drain to Source Voltage	V_{DS}	-	100	V
Gate to Source Voltage	V_{GS}	-	± 20	V
Pulsed Drain Current	I_{DM}	-	80	A
Avalanche Energy, Single Pulse	E_{AS}	$L=0.1mH, T_C=25^{\circ}C$	5	mJ
Power Dissipation	P_D	$T_C=25^{\circ}C$	52	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to 175	$^{\circ}C$

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	50	$^{\circ}C/W$
Thermal Resistance Junction-Case	$R_{\theta JC}$	2.9	$^{\circ}C/W$

Electrical Characteristics at T_J=25°C (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	100	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , I _D =250μA	1.4	1.6	2.4	
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} =0V, V _{DS} =100V, T _J =25°C	-	-	1	μA
		V _{GS} =0V, V _{DS} =100V, T _J =100°C	-	-	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 =10A	-	21.5	25	mΩ
		V _{GS} =4.5V, I _D =7A	-	28	35	
Transconductance	g _{fs}	V _{DS} =5V, I _D =10A	-	22	-	S
Gate Resistance	R _G	V _{GS} =0V, V _{DS} Open, f=1MHz	-	1.8	-	Ω

Dynamic Characteristics

Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =50V, f=1MHz	-	596	-	pF
Output Capacitance	C _{oss}		-	117	-	
Reverse Transfer Capacitance	C _{riss}		-	6.6	-	
Total Gate Charge	Q _g (10V)	V _{DD} =50V, I _D =10A, V _{GS} =10V	-	12	-	nC
Total Gate Charge	Q _g (4.5V)		-	6.4	-	
Gate to Source Charge	Q _{gs}		-	1.6	-	
Gate to Drain (Miller) Charge	Q _{gd}		-	3.4	-	
Turn on Delay Time	t _{d(on)}	V _{DD} =50V, I _D =10A, V _{GS} =10V, R _G =10Ω,	-	6	-	ns
Rise time	t _r		-	3	-	
Turn off Delay Time	t _{d(off)}		-	11	-	
Fall Time	t _f		-	3	-	

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 =50V, I _F =10A, dI _F /dt=500A/μs	-	28	-	ns
Reverse Recovery Charge	Q _{rr}		-	91	-	nC

Fig 1. Typical Output Characteristics

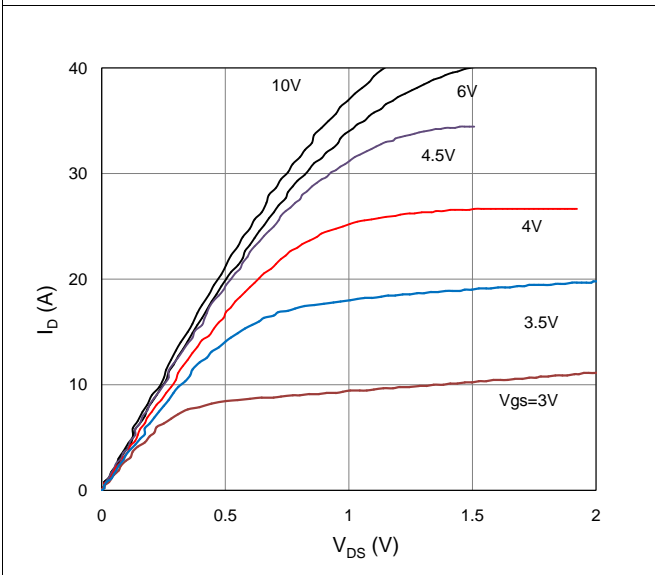


Figure 2. On-Resistance vs. Gate-Source Voltage

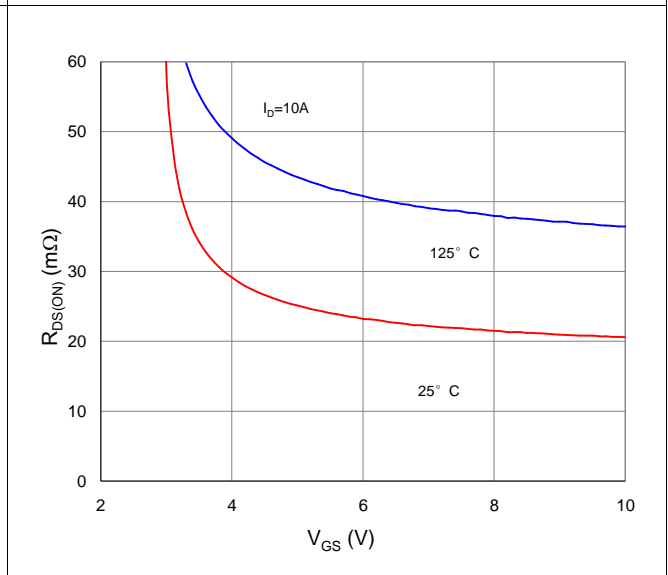


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

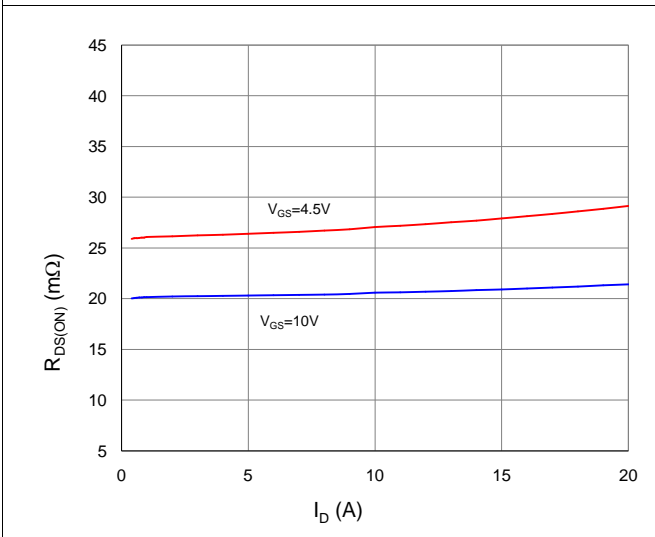


Figure 4. Normalized On-Resistance vs. Junction Temperature

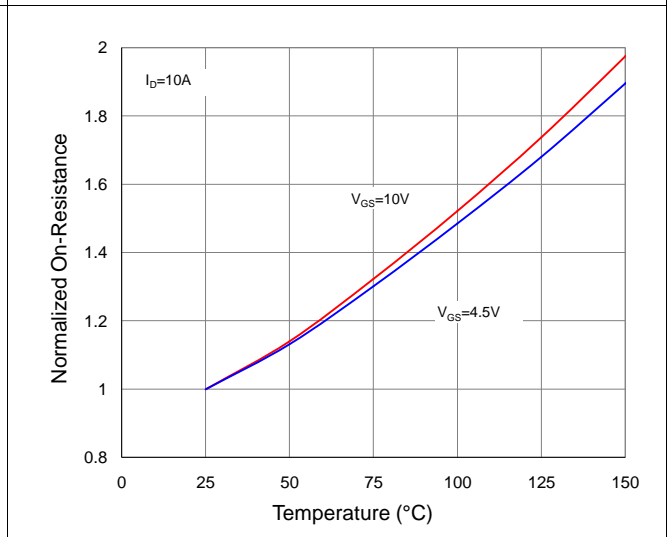


Figure 5. Typical Transfer Characteristics

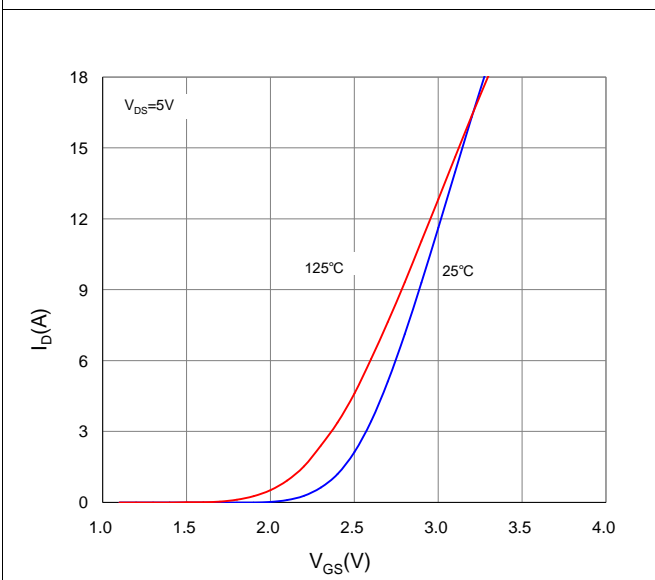


Figure 6. Typical Source-Drain Diode Forward Voltage

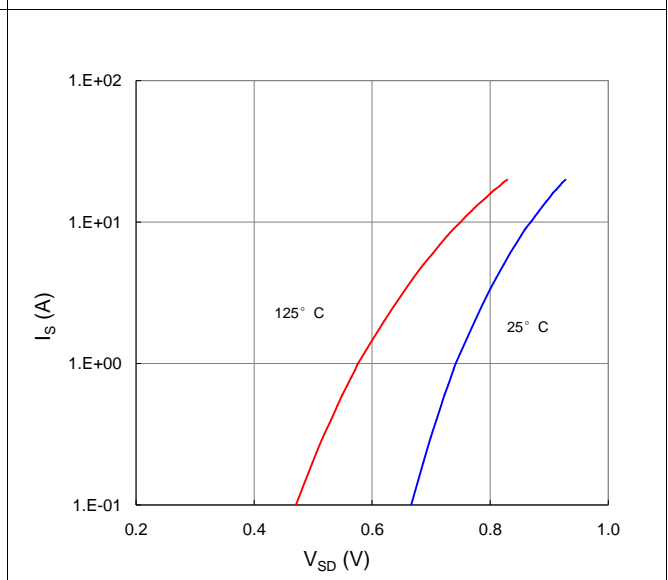


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

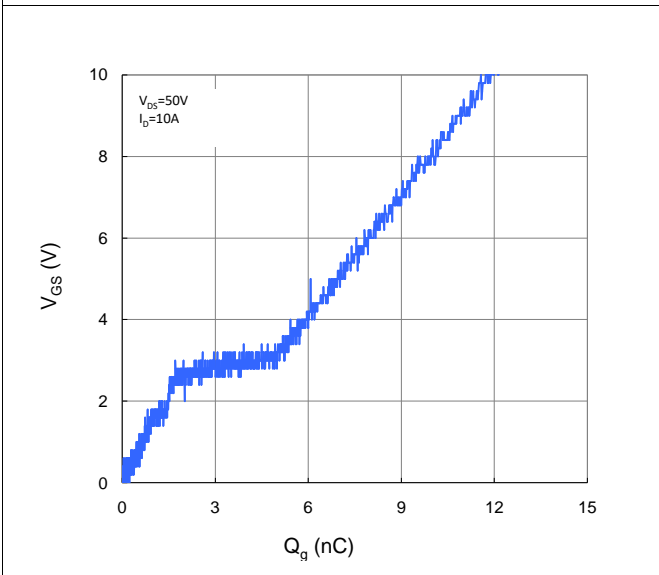


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

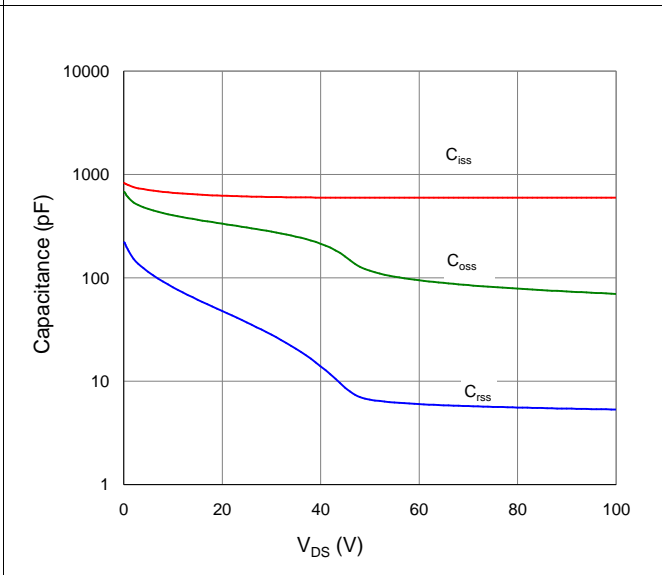


Figure 9. Maximum Safe Operating Area

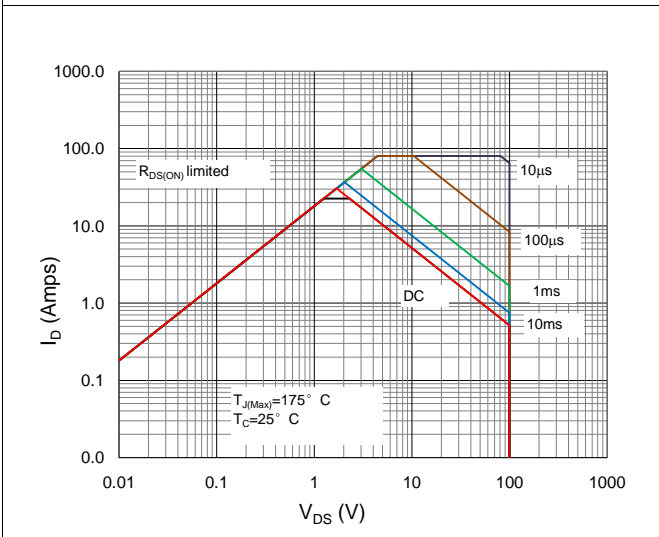


Figure 10. Maximum Drain Current vs. Case Temperature

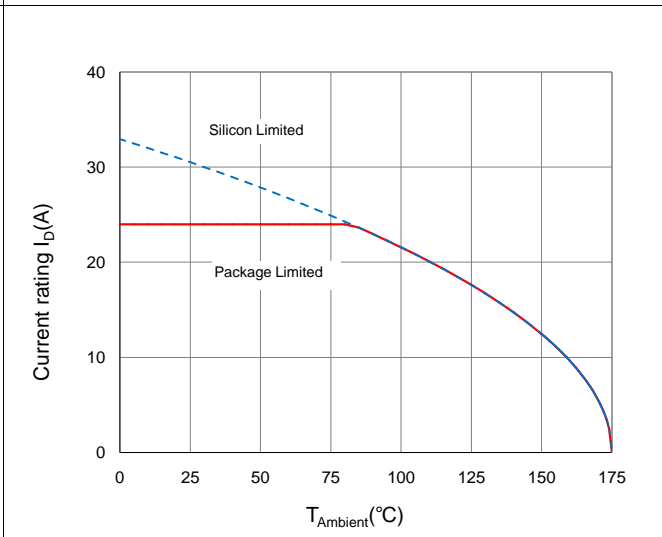
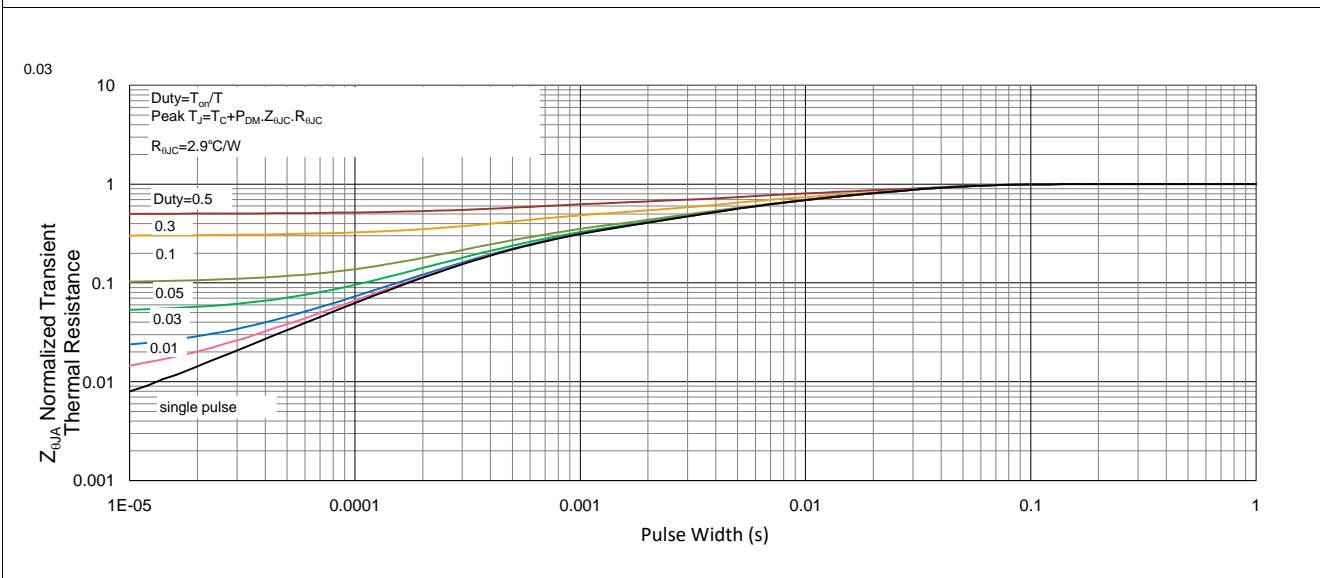
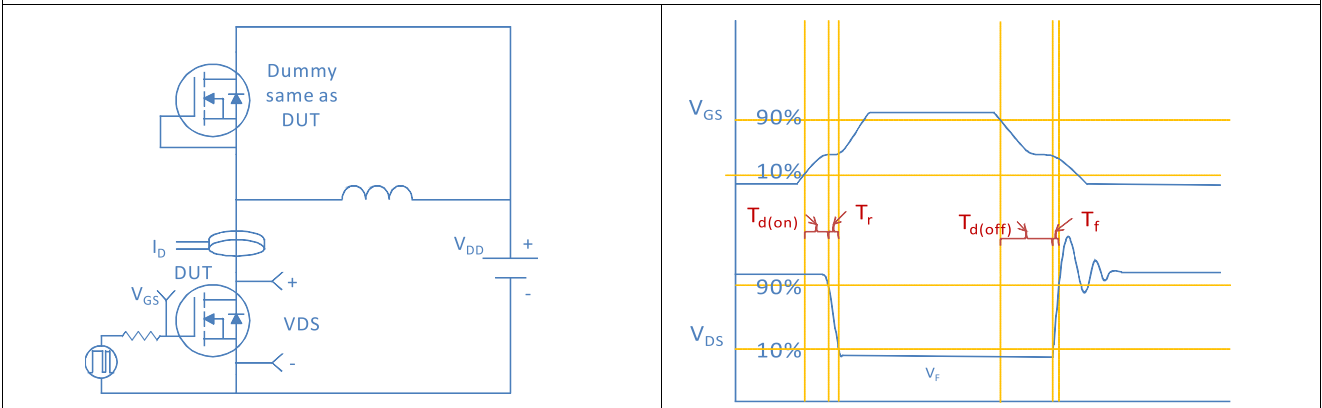


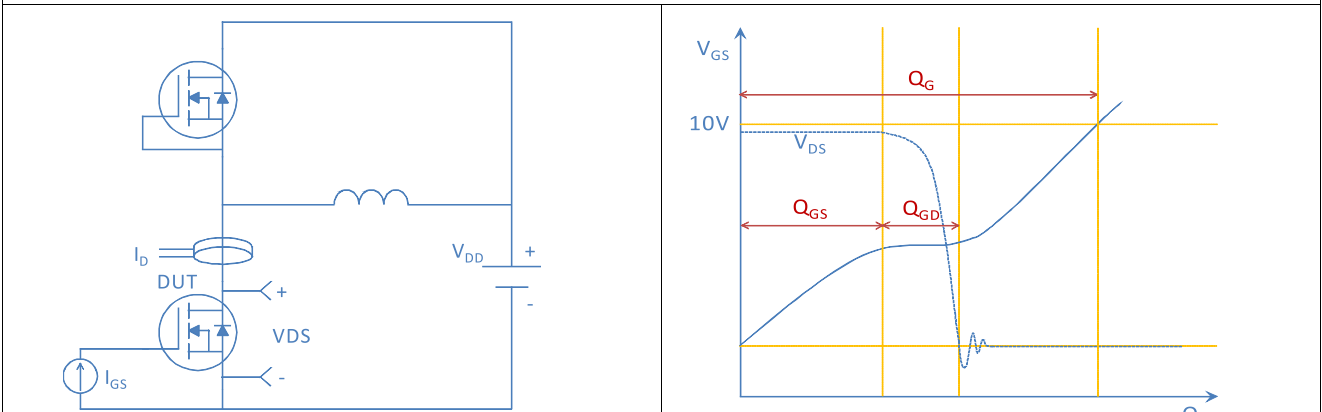
Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient



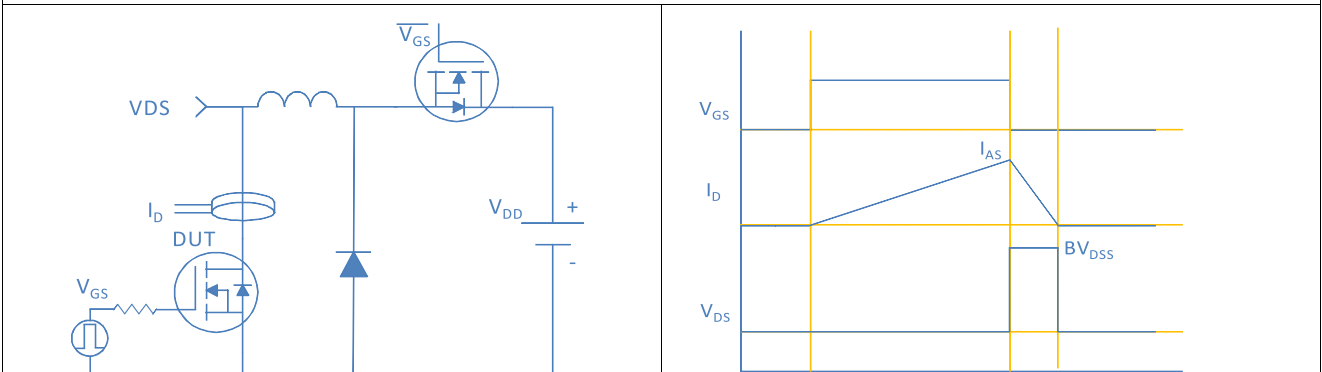
Inductive switching Test



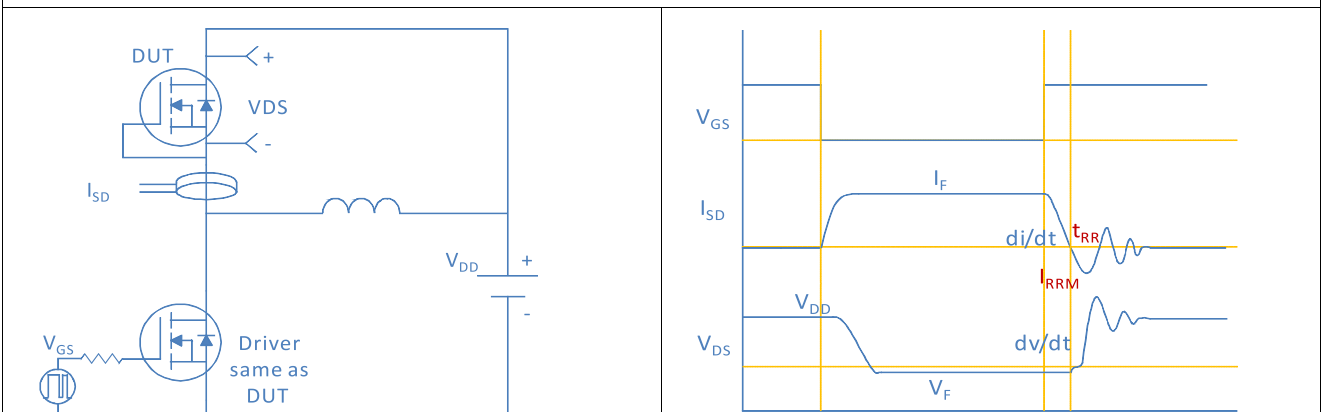
Gate Charge Test



Unclamped Inductive Switching (UIS) Test

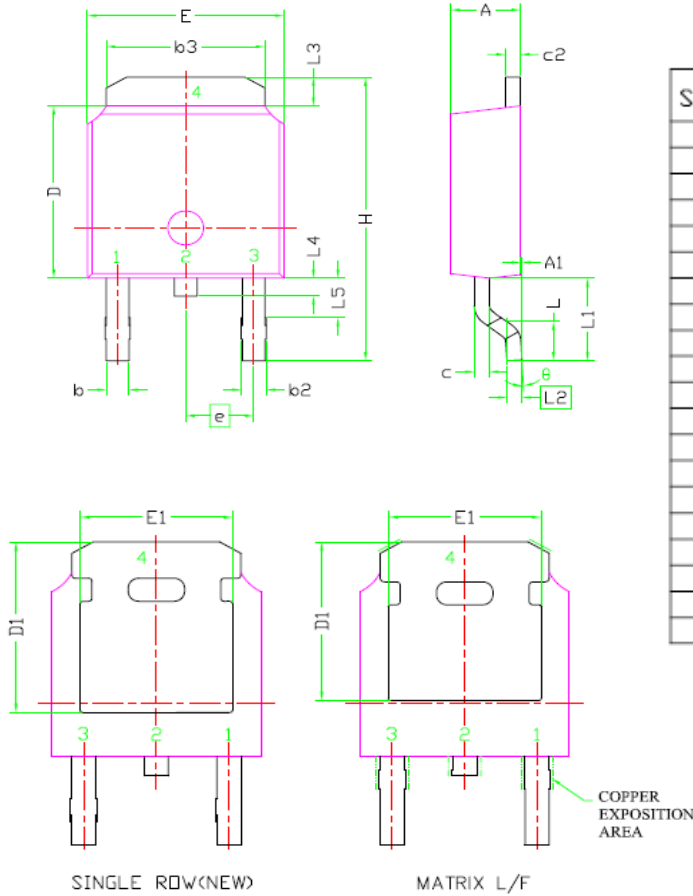


Diode Recovery Test



Package Outline

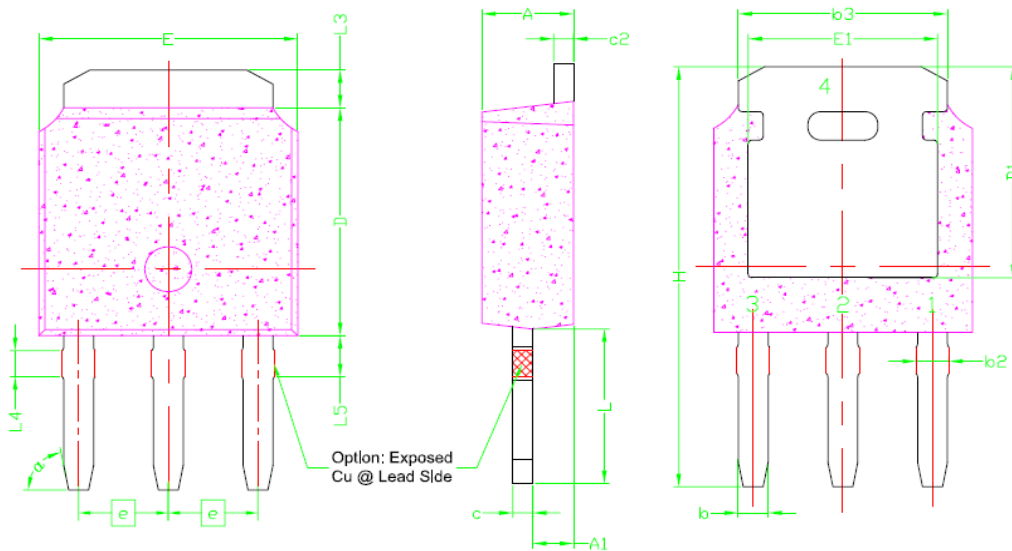
TO-252, 3 leads



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
H	9.40	10.00	10.40
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	--	0.127
c	0.46	0.50	0.60
c2	0.46	0.50	0.58
D1	5.21	--	--
E1	4.40	--	--
θ	0°	--	10°

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	--	--
a	79° REF		