

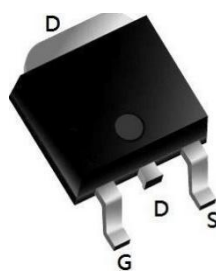


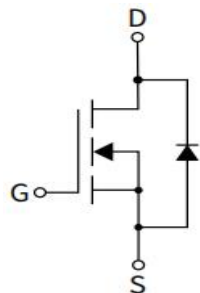
Features ➤ Planar Mosfets ➤ Excellent $R_{DS(ON)}$ ➤ Low Gate Charge ➤ High current Capability ➤ Green product RoHS compliant, lead free	<i>Bvdss</i>	<i>Rdson</i>	<i>ID</i>
	650V	1.2Ω	7A
	Application ➤ PWM applications ➤ Load Switch ➤ Power management		



Package







Marking and pin assignment

TO252-3L top view

Schematic diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Quantity
7N65	HL7N65R	TO252-3L	2500

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	650	V
Gate-Source Voltage		V_{GS}	± 30	V
Continuous Drain Current ¹	$T_C = 25^{\circ}\text{C}$	I_D	7	A
	$T_C = 100^{\circ}\text{C}$		4.4	A
Pulsed Drain Current ²		I_{DM}	28	A
Single Pulse Avalanche Energy ³		E_{AS}	250	mJ
Avalanche Current ³		I_{AS}	7.3	A
Total Power Dissipation ⁴ @ $T_C = 25^{\circ}\text{C}$		P_D	179	W
Storage Temperature Range		T_{STG}	$-55 \sim 150$	$^{\circ}\text{C}$
Operating Junction Temperature Range		T_J	$-55 \sim 150$	$^{\circ}\text{C}$



Thermal Resistance Ratings

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	45	55	°C/W
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	0.5	0.7	°C/W

Ordering Information

Ordering Number	Package	Pin Assignment			Packing
Halogen Free		G	D	S	
HL7N65R	TO252-3L	1	2	3	Tape Reel

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	650	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=650V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	-	-	1	μA
		$V_{DS}=650V, V_{GS}=0V, T_J=55^{\circ}\text{C}$	-	-	5	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2	2.9	4	V
Static Drain-Source On-Resistance ²	$R_{DS(on)}$	$V_{GS}=10V, I_D=3.5A$	-	1.2	1.4	Ω
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=3.5A$	-	1.3	-	S
Gate Resistance	R_g	$V_{DS}=0V, V_{GS}=0V, f=1\text{MHz}$	-	1.7	-	Ω
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$	-	1198	-	pF
Output Capacitance	C_{oss}		-	90	-	
Reverse Transfer Capacitance	C_{rss}		-	2.6	-	
Total Gate Charge	Q_g	$V_{DS}=520V, V_{GS}=10V, I_D=7A$	-	25	-	nC
Gate-Source Charge	Q_{gs}		-	7	-	
Gate-Drain Charge	Q_{gd}		-	7.9	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=325V, R_G=25\Omega, I_D=7A$	-	21	-	ns
Rise Time	t_r		-	49	-	
Turn-Off Delay Time	$t_{d(off)}$		-	89	-	
Fall Time	t_f		-	53	-	
Reverse Recovery Time	t_{rr}	$I_F=7A, di/dt=100A/\mu s,$	-	349	-	ns



Reverse Recovery Charge	Q_{rr}	$V_R=400V$	-	3.1	-	μC
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Note:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous depends on the thermal & electromechanical application board design.
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
3. This single-pulse measurement was taken under the following condition [$L=10mH$, $V_{GS}=10V$, $V_{DS}=50V$] while its value is limited by $T_{J_Max}=150^{\circ}C$.
4. The power dissipation PD is based on $T_{J_Max}=150^{\circ}C$.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Performance Characteristics

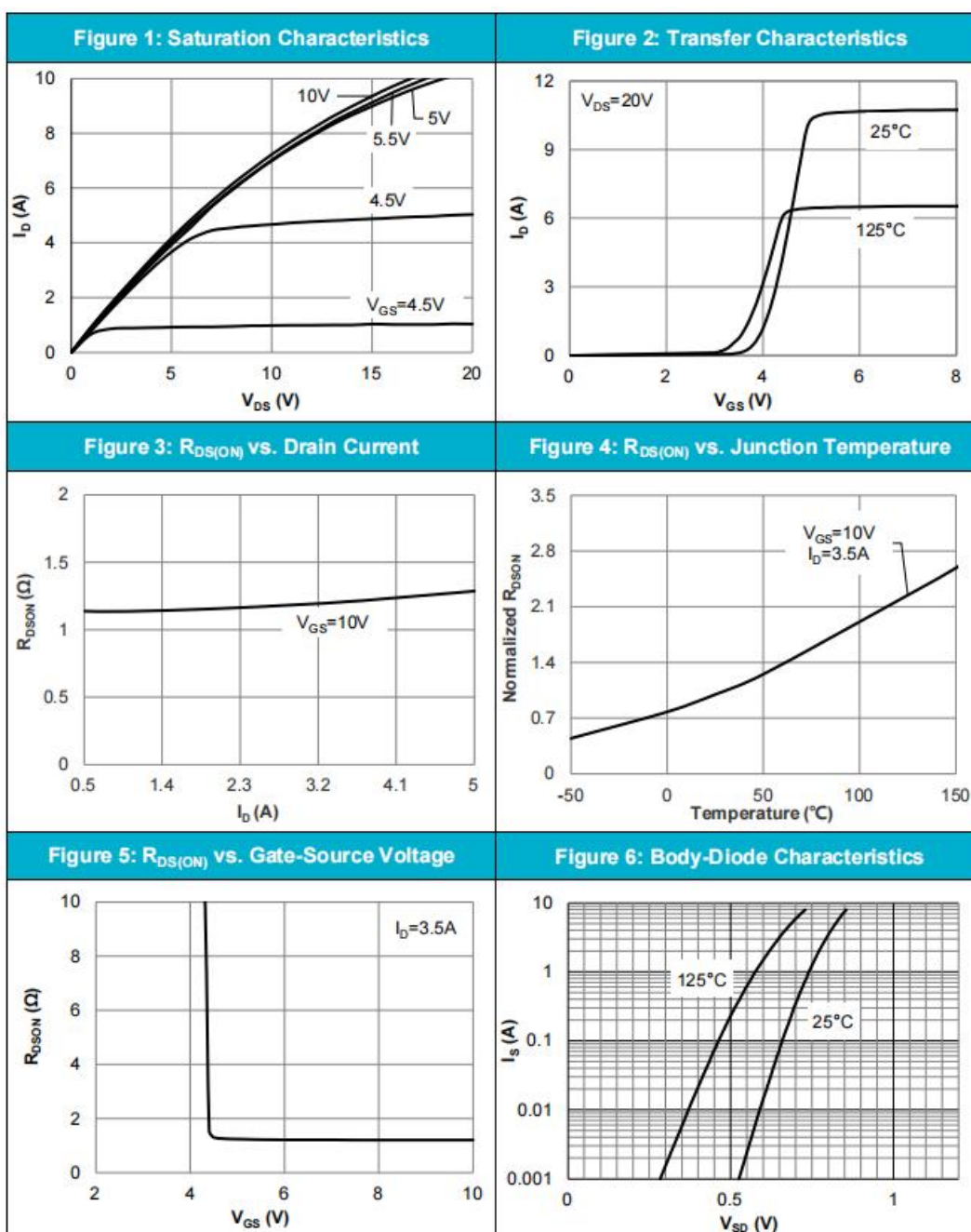




Figure 7: Gate-Charge characteristics

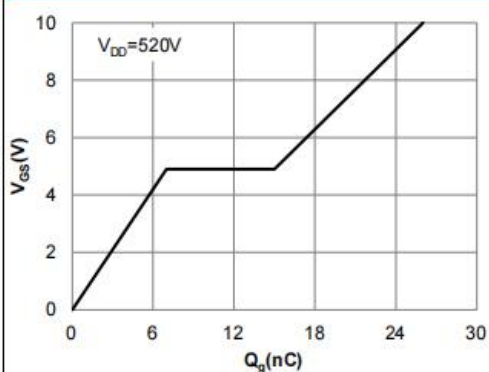


Figure 8: Capacitance characteristics

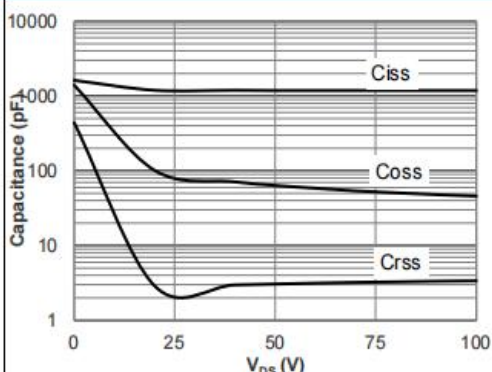


Figure 9: Current De-rating

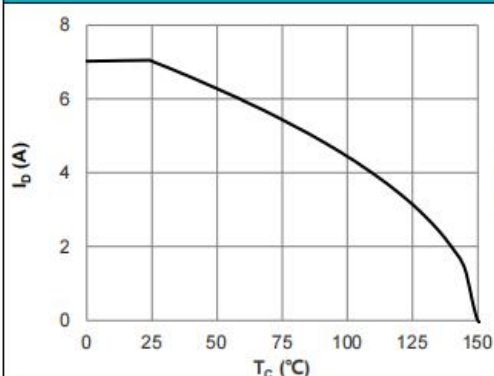


Figure 10: Power De-rating

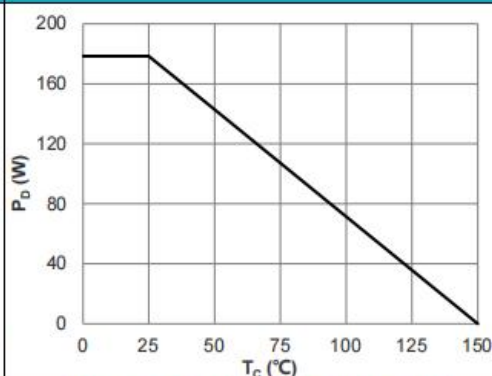


Figure 11: Maximum Safe Operating Area

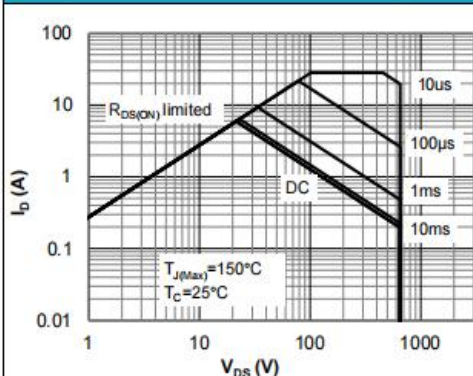


Figure 12: Single Pulse Power Rating, Junction-to-Case

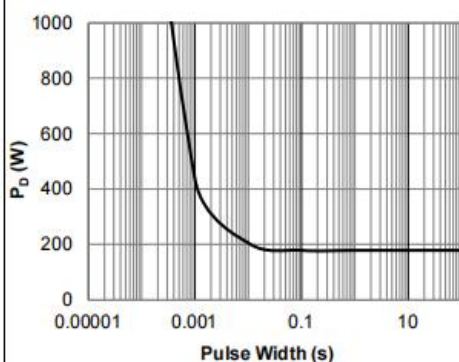
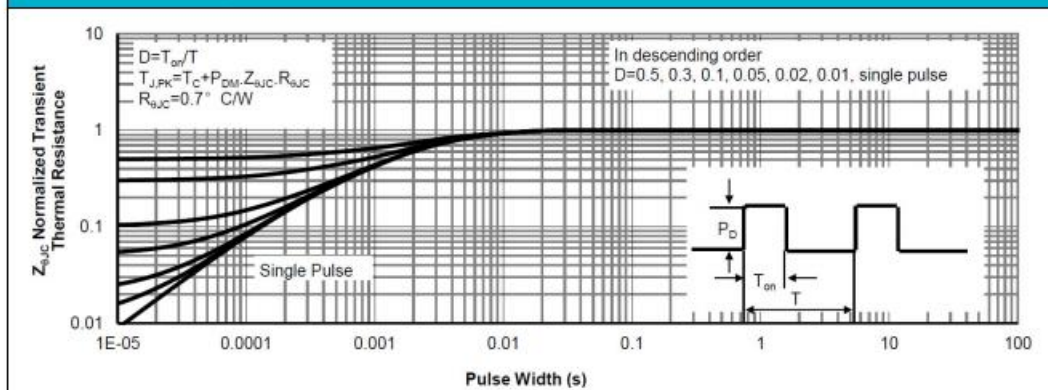


Figure 13: Normalized Maximum Transient Thermal Impedance





Test Circuit & Waveform

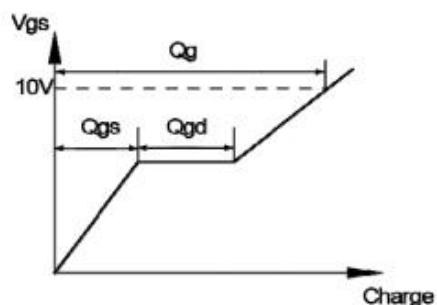
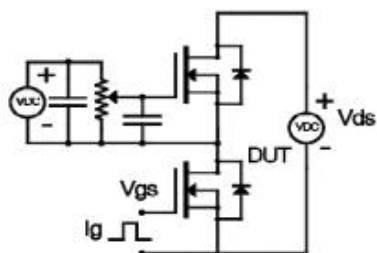


Figure1: Gate Charge Test Circuit & Waveforms

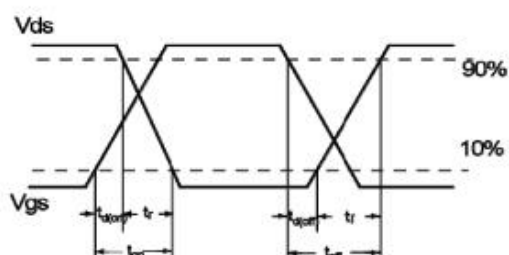
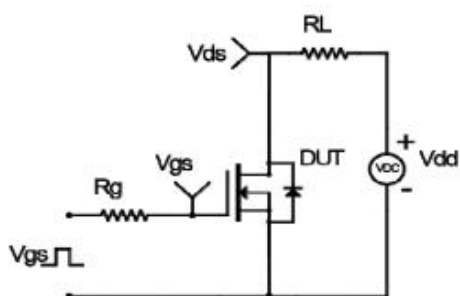


Figure2: Resistive Switching Test Circuit & Waveforms

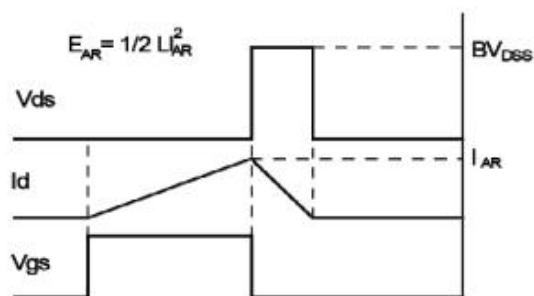
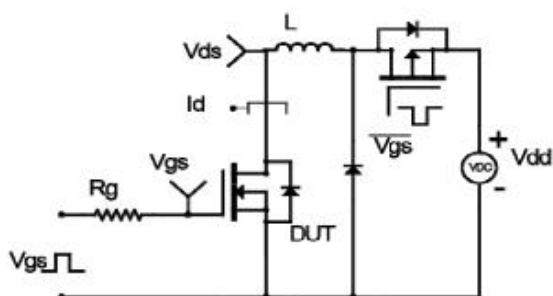


Figure3: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

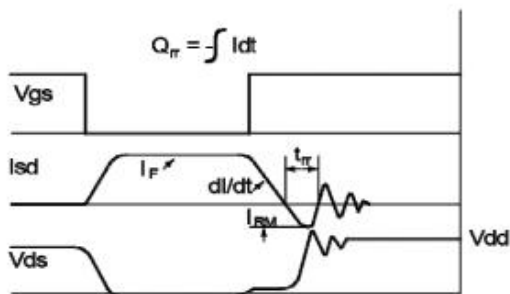
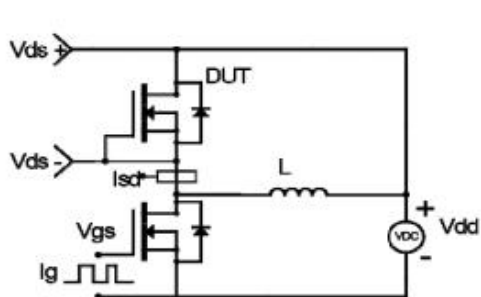
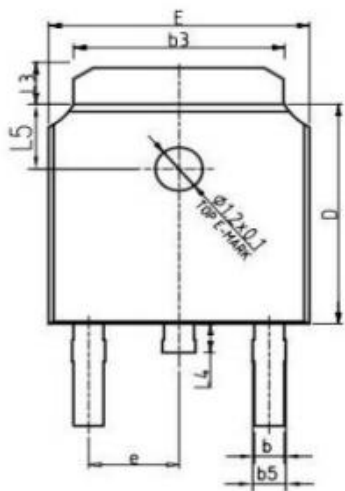


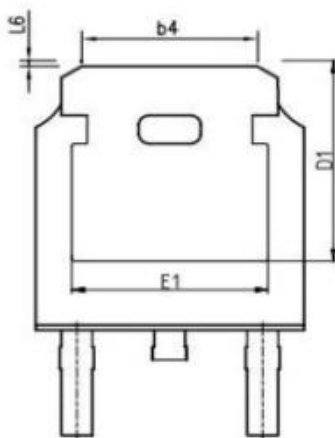
Figure4: Diode Recovery Test Circuit & Waveforms



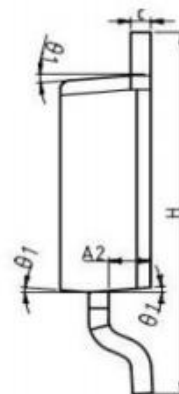
Package Dimensions TO252-3L



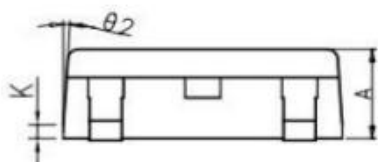
TOP VIEW



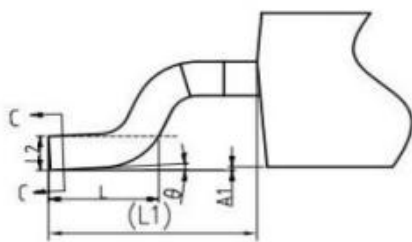
BOTTOM VIEW



SIDE VIEW



SIDE VIEW



SYMBOL	MILLIMETER		
	MIN	TYP.	MAX
A	2.20	2.30	2.38
A1	0.00	-	0.10
A2	0.97	1.07	1.17
b	0.72	0.78	0.85
b3	5.23	5.33	5.46
b4	4.27	4.32	4.37
b5	0.72	0.88	0.93
c	0.47	0.53	0.58
c1	0.46	0.51	0.56
D	6.00	6.10	6.20
E	6.50	6.60	6.70
E1	4.70	4.83	4.92
e	2.286 BSC		
H	9.90	10.10	10.30
L	1.40	1.50	1.70
L3	0.90	-	1.25
L4	0.60	0.80	1.00
L5	1.70	1.80	1.90



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