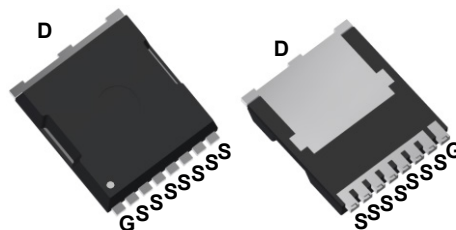
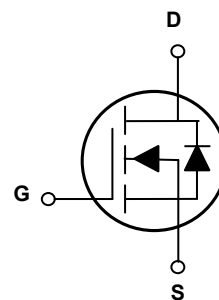


Main Product Characteristics

BV_{DSS}	100V
$R_{DS(ON)}$	1.5m Ω
I_D	300A



TOLL



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The GSGTL1R510 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supplies and a wide variety of other applications.

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

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ($T_c=25^{\circ}\text{C}$)	I_D	300	A
Drain Current-Continuous ($T_c=100^{\circ}\text{C}$)		192	
Drain Current-Pulsed ¹	I_{DM}	1200	A
Single Pulse Avalanche Energy ²	E_{AS}	3120	mJ
Single Pulse Avalanche Current ²	I_{AS}	79	A
Power Dissipation ($T_c=25^{\circ}\text{C}$)	P_D	480	W
Power Dissipation-Derate above 25°C		3.2	W/ $^{\circ}\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.31	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-55 To +175	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-55 To +175	$^{\circ}\text{C}$

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V$ $T_J=25^{\circ}\text{C}$	-	-	1	μA
		$V_{DS}=80V, V_{GS}=0V$ $T_J=85^{\circ}\text{C}$	-	-	30	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=30A$	-	1.2	1.5	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2.0	2.8	4.0	V
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=3A$	-	21	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q_g	$V_{DS}=50V, I_D=100A,$ $V_{GS}=10V$	-	176	265	nC
Gate-Source Charge ^{3,4}	Q_{gs}		-	44	70	
Gate-Drain Charge ^{3,4}	Q_{gd}		-	48	75	
Turn-On Delay Time ^{3,4}	$t_{d(on)}$	$V_{DD}=50V, R_G=6\Omega,$ $V_{GS}=10V, I_D=100A$	-	35	55	nS
Rise Time ^{3,4}	t_r		-	50	75	
Turn-Off Delay Time ^{3,4}	$t_{d(off)}$		-	35	55	
Fall Time ^{3,4}	t_f		-	70	105	
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V,$ $F=1\text{MHz}$	-	10800	16200	pF
Output Capacitance	C_{oss}		-	3050	4580	
Reverse Transfer Capacitance	C_{rss}		-	35	55	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	1.9	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V, \text{ Force Current}$	-	-	300	A
Pulsed Source Current	I_{SM}		-	-	600	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$	-	-	1	V
Reverse Recovery Time	t_{rr}	$V_R=100V, I_S=10A,$ $di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	-	400	-	nS
Reverse Recovery Charge	Q_{rr}		-	1.6	-	μC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. $V_{DD}=50V, V_{GS}=10V, L=1mH, I_{AS}=79A, R_G=25\Omega$, starting $T_J=25^{\circ}\text{C}$.
3. Pulsed test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. Essentially independent of operation temperature.

Typical Electrical and Thermal Characteristic Curves

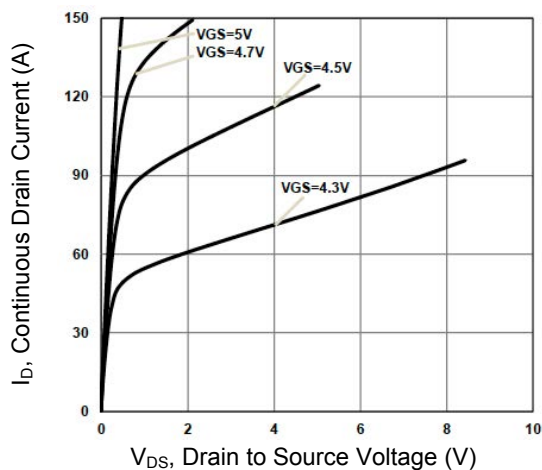


Figure 1. Typical Output Characteristics

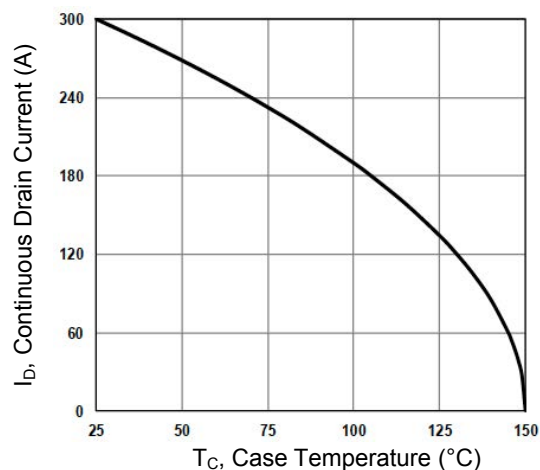


Figure 2. Continuous Drain Current vs. T_C

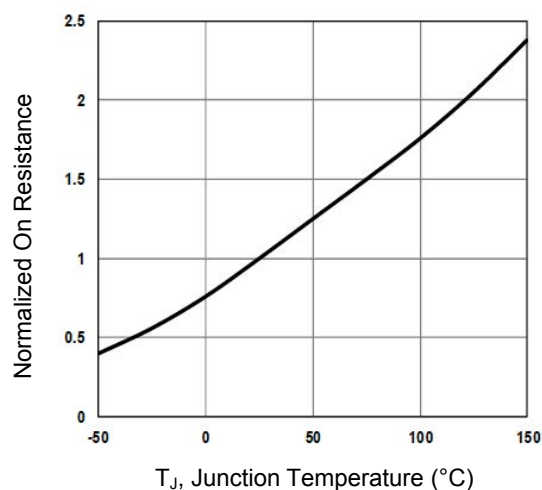


Figure 3. Normalized $R_{DS(on)}$ vs. T_J

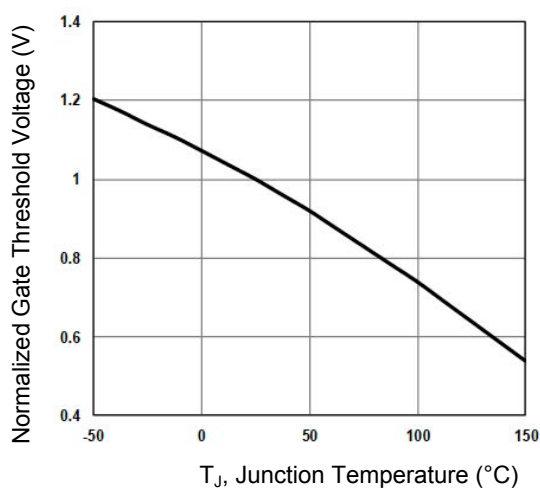


Figure 4. Normalized V_{th} vs. T_J

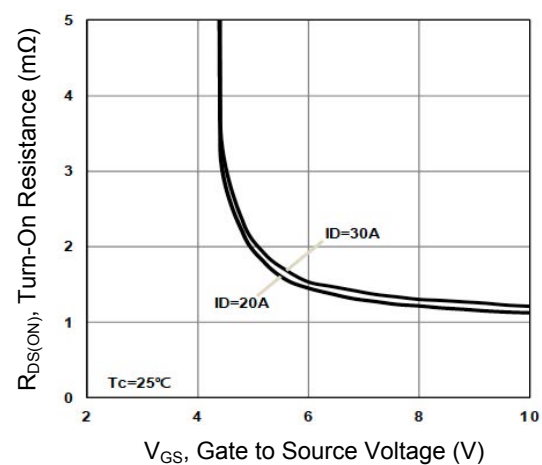


Figure 5. Turn-On Resistance vs. V_{GS}

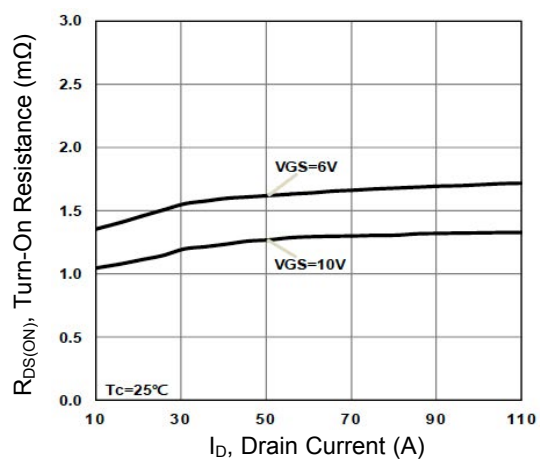


Figure 6. Turn-On Resistance vs. I_D

Typical Electrical and Thermal Characteristic Curves

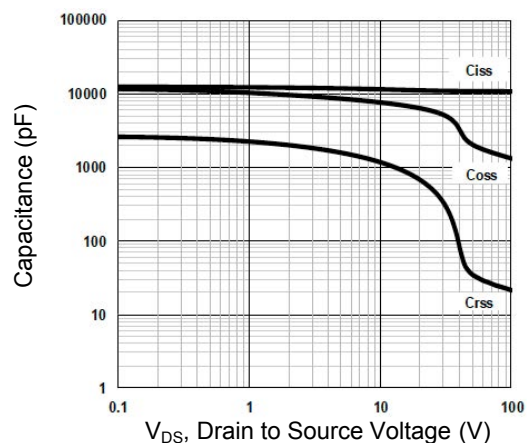


Figure 7. Capacitance Characteristics

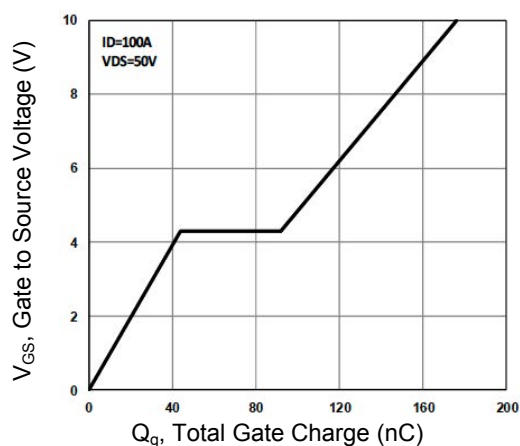


Figure 8. Gate Charge Characteristics

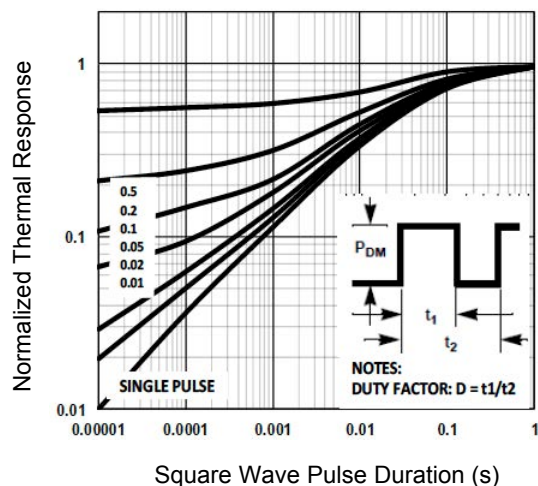


Figure 9. Normalized Transient Impedance

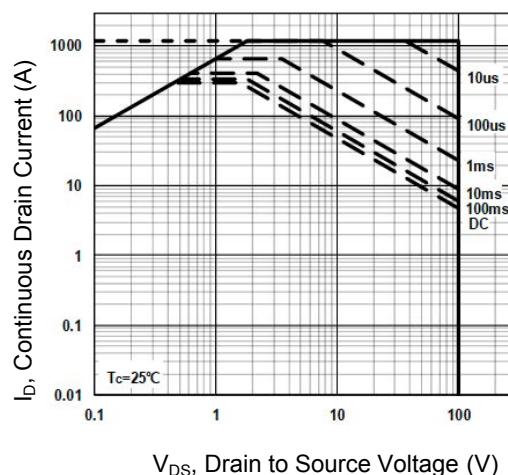


Figure 10. Maximum Safe Operation Area

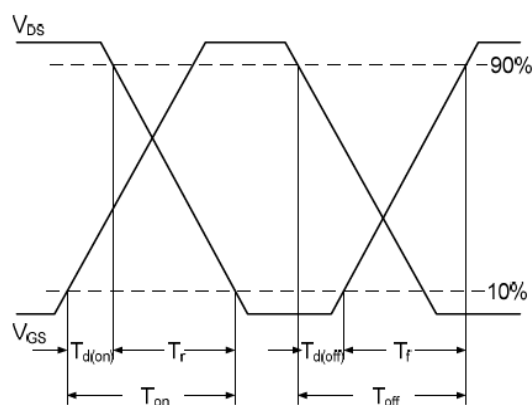


Figure 11. Switching Time Waveform

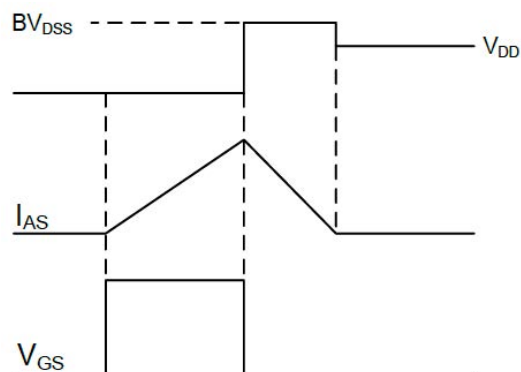
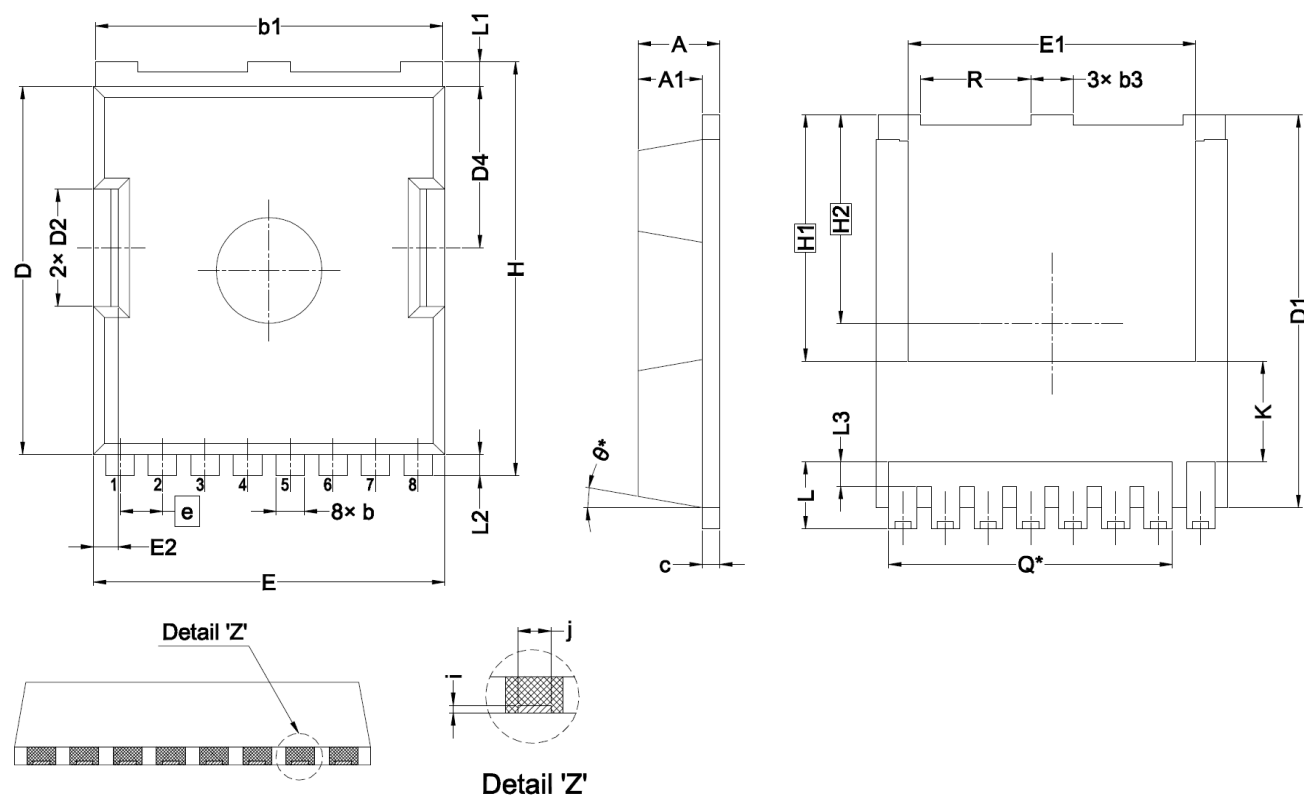


Figure 12. EAS Waveform

Package Outline Dimensions (TOLL)



Symbol	Dimensions in Millimeters			Symbol	Dimensions in Millimeters		
	MIN	NOM	MAX		MIN	NOM	MAX
A	2.20	2.30	2.40	H	11.58	11.68	11.78
A1	1.70	1.80	1.90	H1	6.95 BSC		
b	0.70	0.80	0.90	H2	5.89 BSC		
b1	9.70	9.80	9.90	i	0.10 REF		
b3	1.10	1.20	1.30	j	0.46 REF		
c	0.40	0.50	0.60	K	2.80 REF		
D	10.28	10.38	10.48	L	1.40	1.90	2.10
D1	10.98	11.08	11.18	L1	0.60	0.70	0.80
D2	3.20	3.30	3.40	L2	0.50	0.60	0.70
D4	4.45	4.55	4.65	L3	0.30	0.70	0.80
E	9.80	9.90	10.00	N	8		
E1	8.00	8.10	8.20	Q	8.00 REF		
E2	0.60	0.70	0.80	R	3.00	3.10	3.20
e	1.20 BSC			theta	10° REF		

Recommended Pad Layout

