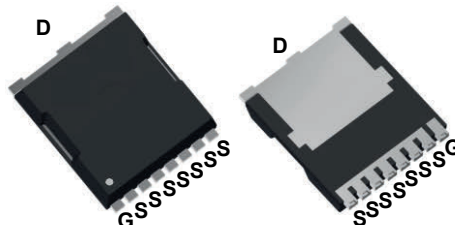
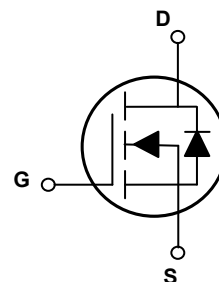


Main Product Characteristics

$V_{(BR)DSS}$	40V
$R_{DS(ON)}$	1.1m Ω (Max.)
I_D	304A



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 GSGTL1R104 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}	40	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, @ Steady-State ($T_C=25^{\circ}\text{C}$) ¹	I_D	304	A
Continuous Drain Current, @ Steady-State ($T_C=100^{\circ}\text{C}$) ¹		216	A
Pulsed Drain Current ($T_C=25^{\circ}\text{C}$) ²	I_{DM}	1220	A
Power Dissipation ($T_C=25^{\circ}\text{C}$) ³	P_D	180	W
Single Pulse Avalanche Energy	E_{AS}	560	mJ
Single Pulse Current	I_{AS}	47	A
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	50	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.83	$^{\circ}\text{C/W}$
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +175	$^{\circ}\text{C}$
Soldering Temperature (SMD)	T_{SOLD}	260	$^{\circ}\text{C}$

Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	40	-	-	V
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V, T _J =25°C	-	-	1.0	μA
		V _{DS} =40V, V _{GS} =0V, T _J =125°C	-	3.5	-	
Gate-to-Source Forward Leakage	I _{GSS}	V _{DS} =0V, V _{GS} =20V	-	-	100	nA
		V _{DS} =0V, V _{GS} =-20V	-	-	-100	
Static Drain-to-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =50A	-	0.95	1.1	mΩ
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.1	-	3.9	V
Dynamic and Switching Characteristics						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =20V, f=1MHz	-	4606	-	pF
Output Capacitance	C _{oss}		-	1897	-	
Reverse Transfer Capacitance	C _{rss}		-	103	-	
Total Gate Charge ^{4,5}	Q _g	I _D =90A, V _{DD} =20V, V _{GS} =10V	-	64	-	nC
Gate-to-Source Charge ^{4,5}	Q _{gs}		-	22	-	
Gate-to-Drain ("Miller") Charge ^{4,5}	Q _{gd}		-	12	-	
Gate-to-Plateau ^{4,5}	V _{plateau}		-	4.86	-	V
Turn-On Delay Time ^{4,5}	t _{d(on)}	V _{DD} =20V, V _{GS} =10V, R _G =6.0Ω, I _D =90A	-	38	-	nS
Rise Time ^{4,5}	t _r		-	30	-	
Turn-Off Delay Time ^{4,5}	t _{d(off)}		-	40	-	
Fall Time ^{4,5}	t _f		-	25	-	
Gate Resistance	R _g	f=1MHz	-	1.6	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I _S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-	304	A
Diode Pulse Current	I _{S,pulse}		-	-	1220	A
Diode Forward Voltage	V _{SD}	I _S =50A, V _{GS} =0V	-	-	1.4	V
Reverse Recovery Time ⁴	T _{rr}	I _S =90A, V _{GS} =0V, V _R =20V, dI _F /dt=100A/μs	-	57.8	-	nS
Reverse Recovery Charge ⁴	Q _{rr}		-	56.2	-	nC

Notes:

1. The rated value only refers to the maximum absolute value under the case temperature of 25 degrees in the manual, If the case temperature is higher than 25 degrees, the frequency needs to be reduced according to the actual environmental conditions.
2. Pulse time of 5μs, pulse width limited by maximum junction temperature.
3. The dissipated power value will change with the temperature. When it is greater than 25°C, the dissipated power value will decrease by 1.11°C/W for every 1 degree of temperature increase.
4. Pulse test: Pulse width ≤ 300μs, duty cycle ≤ 2%.
5. Basically unaffected by operating temperature.

Typical Electrical and Thermal Characteristic Curves

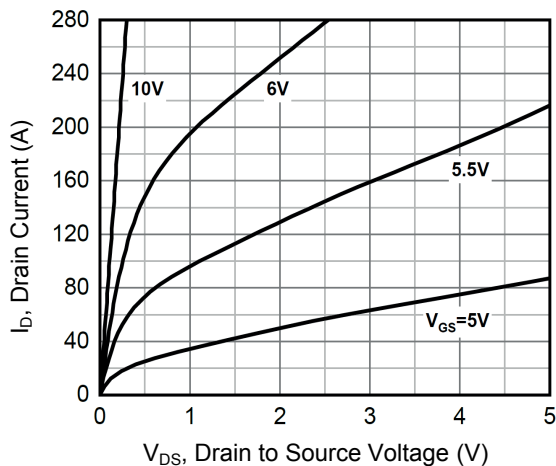


Figure 1. Typical Output Characteristics

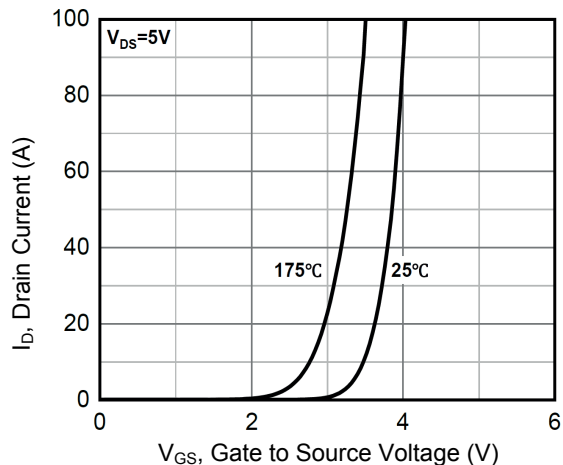


Figure 2. Transfer Characteristics

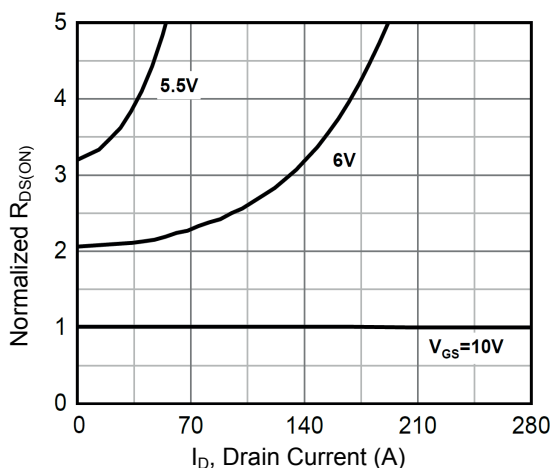


Figure 3. Normalized $R_{DS(ON)}$ vs. I_D

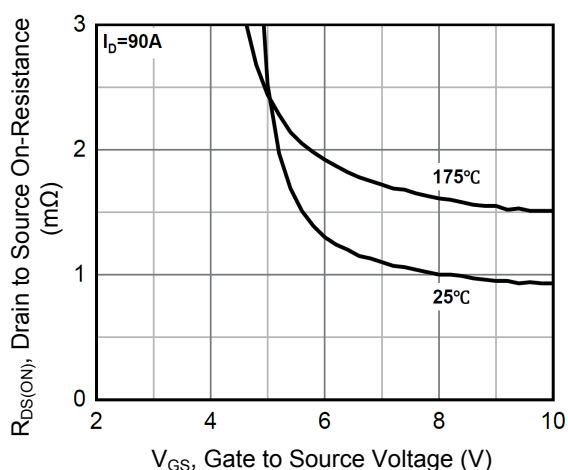


Figure 4. $R_{DS(ON)}$ vs. Gate to Source Voltage

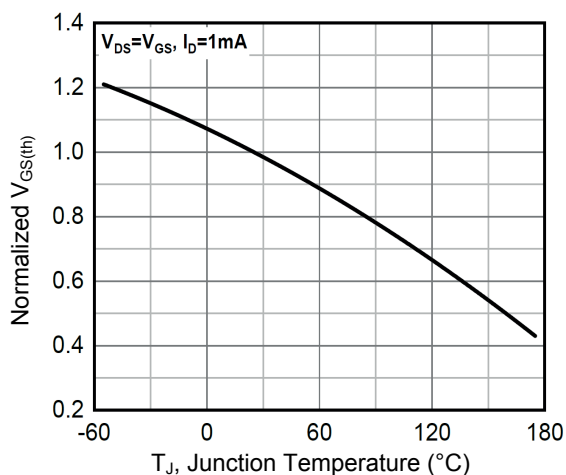


Figure 5. Normalized $V_{GS(th)}$ vs. T_J

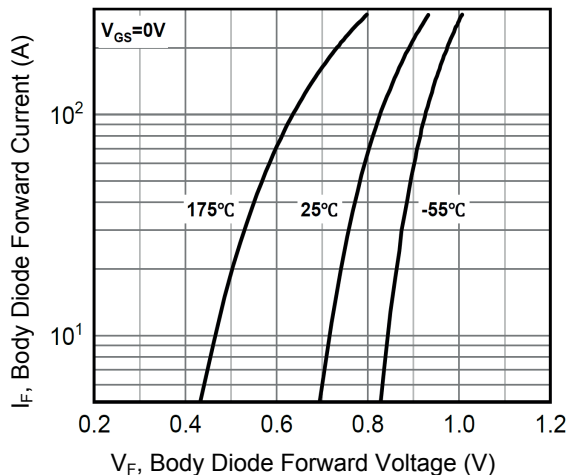


Figure 6. I_F vs. V_F

Typical Electrical and Thermal Characteristic Curves

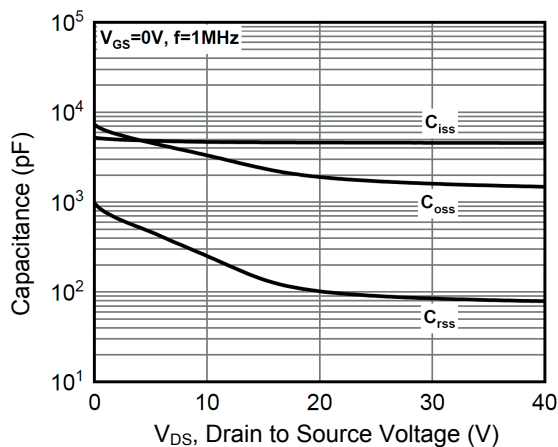


Figure 7. Capacitance Characteristics

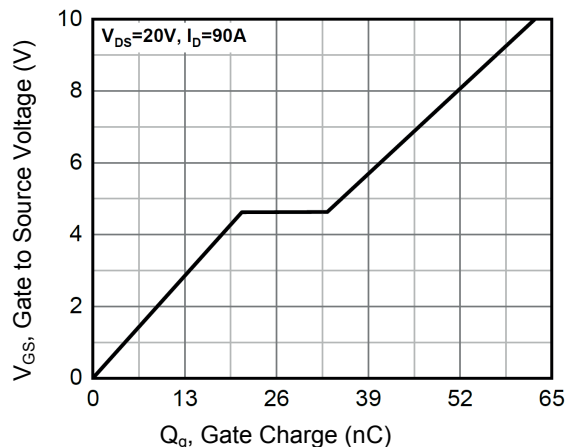


Figure 8. Gate Charge Characteristics

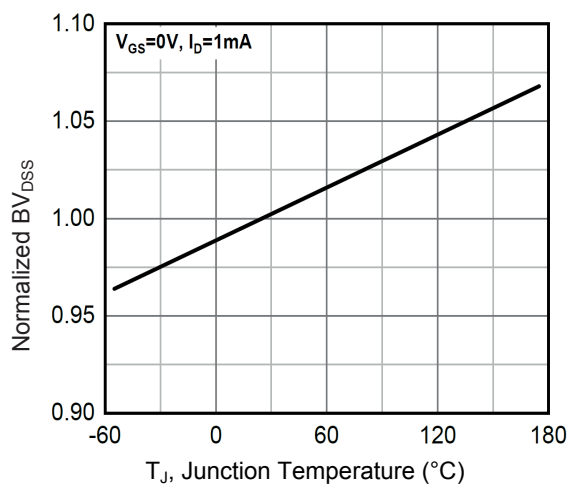


Figure 9. Normalized BV_{DS} vs. T_J

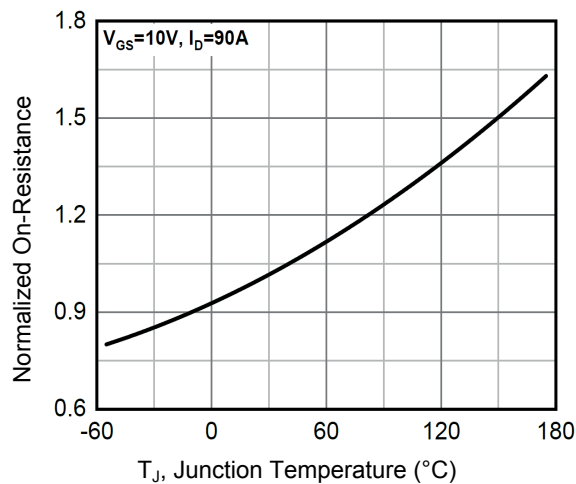


Figure 10. Normalized $R_{DS(ON)}$ vs. T_J

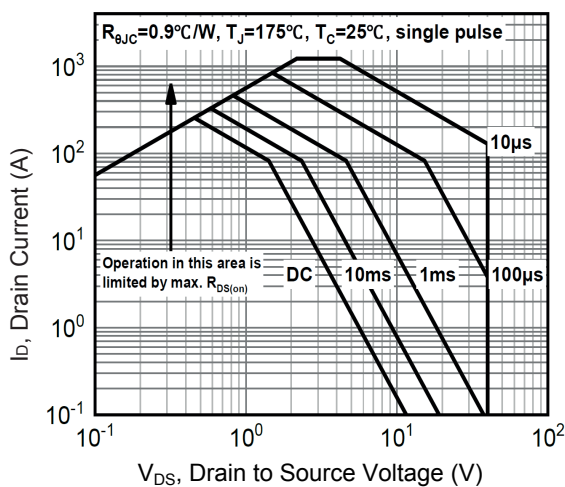


Figure 11. Safe Operation Area

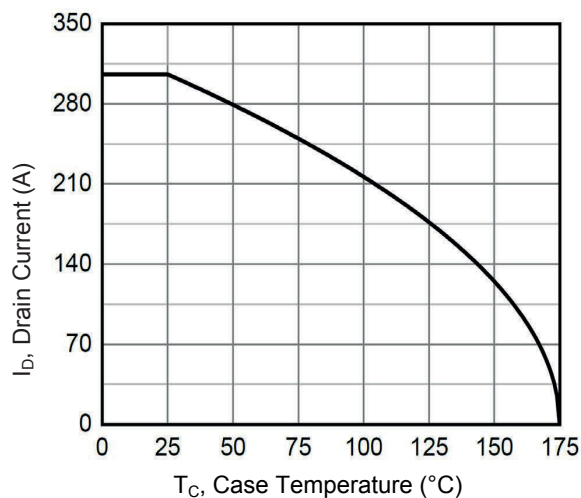
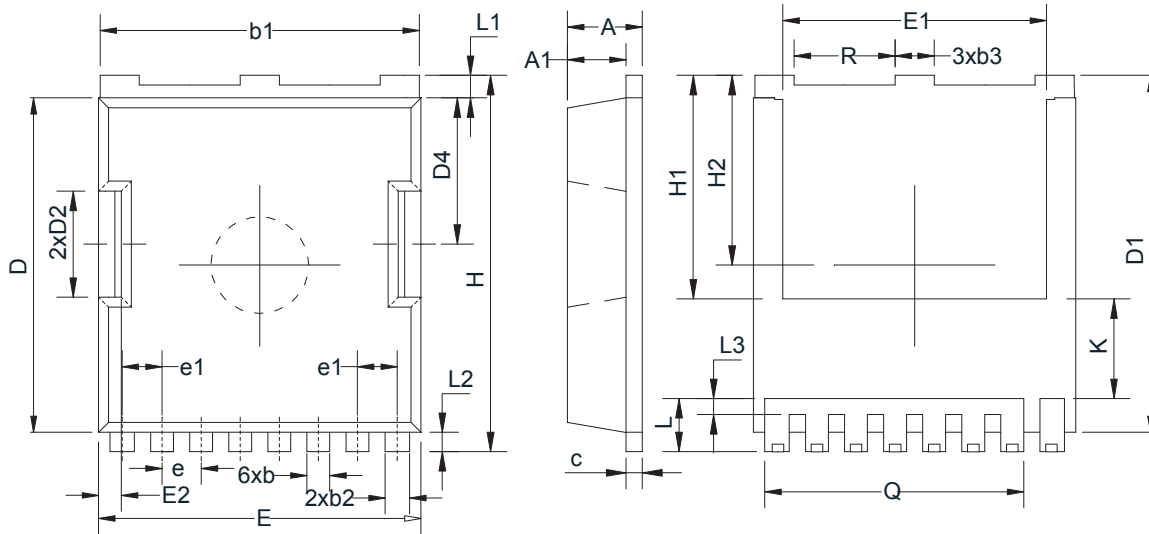


Figure 12. I_D vs. T_C

Package Outline Dimensions (TOLL)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.25	2.35	0.089	0.093
A1	1.75	1.85	0.069	0.073
b	0.65	0.75	0.026	0.030
b1	9.75	9.85	0.384	0.388
b2	0.70	0.80	0.028	0.031
b3	1.15	1.25	0.045	0.049
c	0.45	0.55	0.018	0.022
D	10.35	10.45	0.407	0.411
D1	11.00	11.20	0.433	0.441
D2	3.25	3.35	0.128	0.132
D4	4.50	4.60	0.177	0.181
e	1.200 BSC		0.047 BSC	
e1	1.225 BSC		0.048 BSC	
E	9.85	9.95	0.388	0.392
E1	8.00	8.20	0.315	0.323
E2	0.65	0.75	0.026	0.030
H	11.60	11.80	0.457	0.465
H1	6.95 BSC		0.274 BSC	
H2	5.90 BSC		0.232 BSC	
K	3.10 REF		0.122 REF	
L	1.55	1.75	0.061	0.069
L1	0.65	0.75	0.026	0.030
L2	0.50	0.70	0.020	0.028
L3	0.40	0.60	0.016	0.024
Q	7.95 REF		0.313 REF	
R	3.05	3.15	0.120	0.124

Order Information

Device	Package	Marking	Carrier	Quantity
GSGTL1R104	TOLL	TL1R104	Tape & Reel	2,000 Pcs / Reel

For more information, please contact us at: inquiry@goodarksemi.com