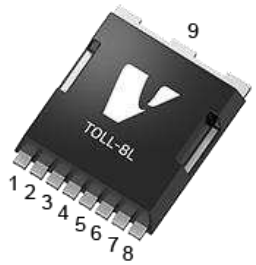
VDG10N012LSA

N-Channel Enhancement Mode MOSFET

Features

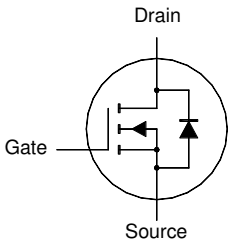
- AEC-Q101 Qualified, high reliability
- Robust design
- Very low on-resistance R_{DS}(on)
- N-channel - Enhancement mode
- Halogen and Antimony Free(HAF), RoHS compliant



TOLL-8L
1.Gate(G)
2.3.4.5.6.7.8 Source(S)
9.Drain(D)

Applications

- Powertrain Management
- Electrical Power Steering
- Motor Drive
- Primary Switch for 12V System
- Industrial Automation
- Battery Protection



Key Parameters

Parameter	Value	Unit
BV_{DSS}	100	V
$R_{DS(ON)}$ Max	1.25 @ V_{GS} = 10 V	mΩ
	2.0 @ V_{GS} = 4.5 V	
Q_g typ	242 @ V_{GS} = 10 V	nC

Absolute Maximum Ratings(at Ta = 25℃ unless otherwise specified)

Parameter	Symbol	Max	Max	Unit
Drain-Source Voltage	V_{DS}	100		V
Gate-Source Voltage	V_{GS}		± 20	V
Drain Current T_c = 25℃	I_D		300	A
Drain Current T_c = 100℃			300	
Peak Drain Current, Pulsed [1]	I_{DM}		1200	A
Continuous-Source Current	I_S		300	A
Single Pulse Avalanche Energy V_{DD}= 50 V , L= 1 mH	E_{AS}		1000	mJ
Power Dissipation T_c = 25℃	P_{tot}		600	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55	175	℃

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Case [2]	$R_{\theta JC}$	0.25	℃/W
Thermal Resistance from Junction to Ambient [2]	$R_{\theta JA}$	40	℃/W

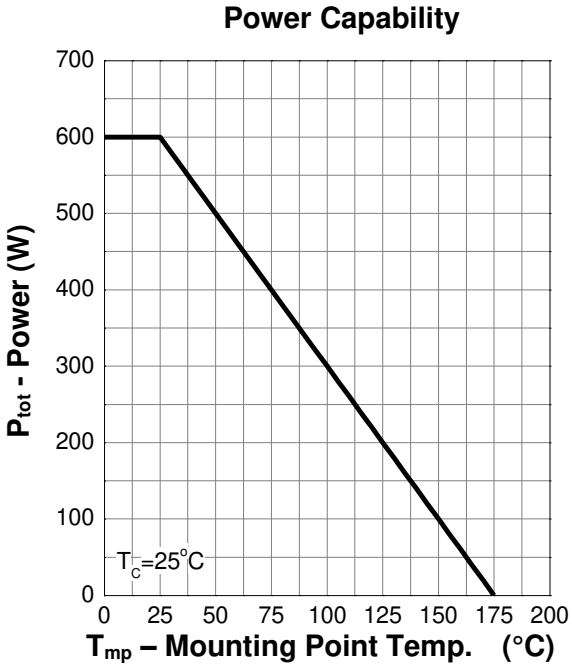
[1] Pulse width ≤ 300 μs, duty cycle ≤ 2 %
[2] Surface Mounted on minimum footprint pad area
[3] limited by bonding wire

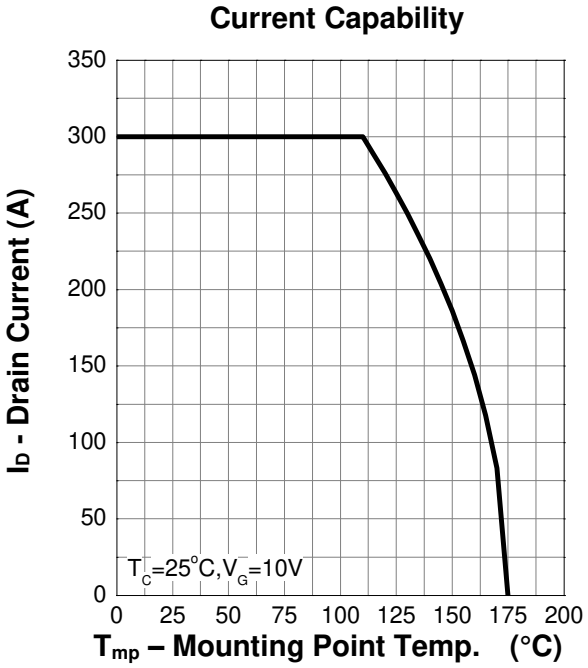
Characteristics at T_a = 25℃ unless otherwise specified

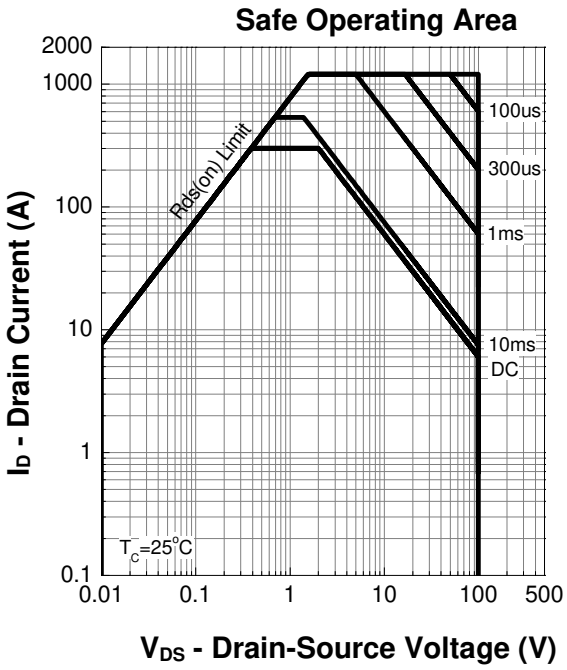
Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at I_D = 250 µA	BV_{DSS}	100	-	-	V
Drain-Source Leakage Current at V_{DS} = 80 V	I_{DSS}	-	-	1	µA
Gate Leakage Current at V_{GS} = ± 20 V	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage at V_{DS} = V_{GS}, I_{DS} = 250 µA	$V_{GS(th)}$	1	-	3	V
Drain-Source On-State Resistance [1] at V_{GS} = 10 V, I_{DS} = 50 A at V_{GS} = 4.5V, I_{DS} = 25 A	$R_{DS(on)}$	- -	1.1 1.5	1.25 2.0	mΩ
DYNAMIC PARAMETERS [2]					
Input Capacitance at V_{GS} = 0 V, V_{DS} = 50 V, f = 1 MHz	C_{iss}	-	12023	-	pF
Output Capacitance at V_{GS} = 0 V, V_{DS} = 50 V, f = 1 MHz	C_{oss}	-	2071	-	pF
Reverse Transfer Capacitance at V_{GS} = 0 V, V_{DS} = 50 V, f = 1 MHz	C_{rss}	-	89	-	pF
Gate charge total [2] at V_{DS} = 50 V, V_{GS} = 10 V, I_D = 50 A	Q_g	-	242	--	nC
Gate to Source Charge at V_{DS} = 50 V, V_{GS} = 10 V, I_D = 50 A	Q_{gs}	-	46	-	nC
Gate to Drain Charge at V_{DS} = 50 V, V_{GS} = 10 V, I_D = 50 A	Q_{gd}	-	65	-	nC
Turn-On Delay Time at V_{DS} = 50 V, V_{GEN} = 10 V, I_{DS} = 50 A, R_g = 4.5 Ω, R_L=1Ω	$t_{d(on)}$	-	28	-	ns
Turn-On Rise Time at V_{DS} = 50 V, V_{GEN} = 10 V, I_{DS} = 50 A, R_g = 4.5 Ω, R_L=1Ω	t_r	-	107	-	ns
Turn-Off Delay Time at V_{DS} = 50 V, V_{GEN} = 10 V, I_{DS} = 50 A, R_g = 4.5 Ω, R_L=1Ω	$t_{d(off)}$	-	200	-	ns
Turn-Off Fall Time at V_{DS} = 50 V, V_{GEN} = 10 V, I_{DS} = 50 A, R_g = 4.5 Ω, R_L=1Ω	t_f	-	177	-	ns
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage [1] at I_S = 50 A, V_{GS} = 0 V	V_{SD}	-	-	1.3	V
Body Diode Reverse Recovery Time at I_{DS} = 50 A, di_{SD}/dt = 100 A / µs	t_{rr}	-	137	-	ns
Body Diode Reverse Recovery Charge at I_{DS} = 50 A, di_{SD}/dt = 100 A / µs	Q_{rr}	-	347	-	nC

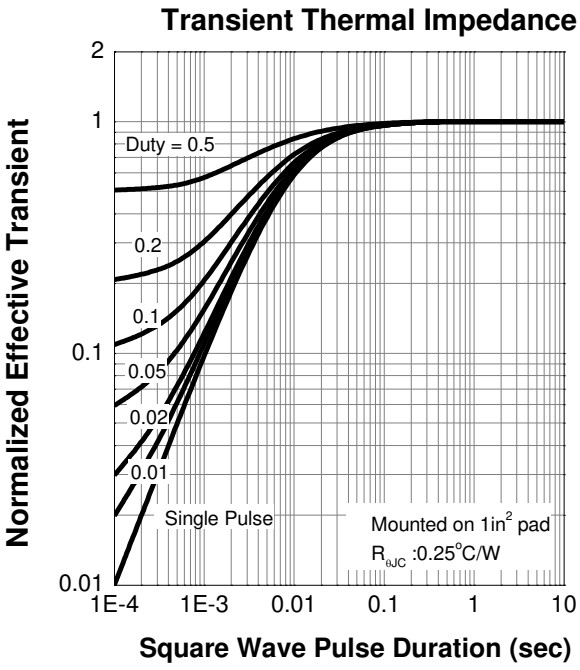
Notes:
[1] Pulse test ; pulse width ≤ 300 µs, duty cycle ≤ 2%
[2] Guaranteed by design, not subject to production testing

Typical Characteristics

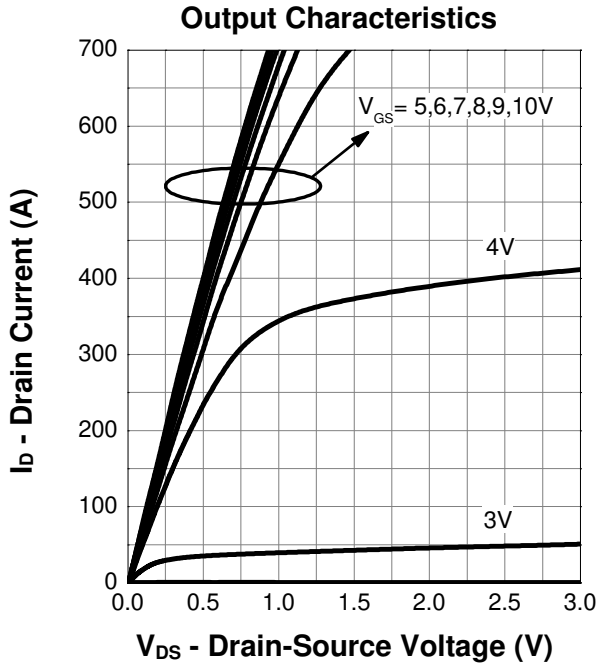


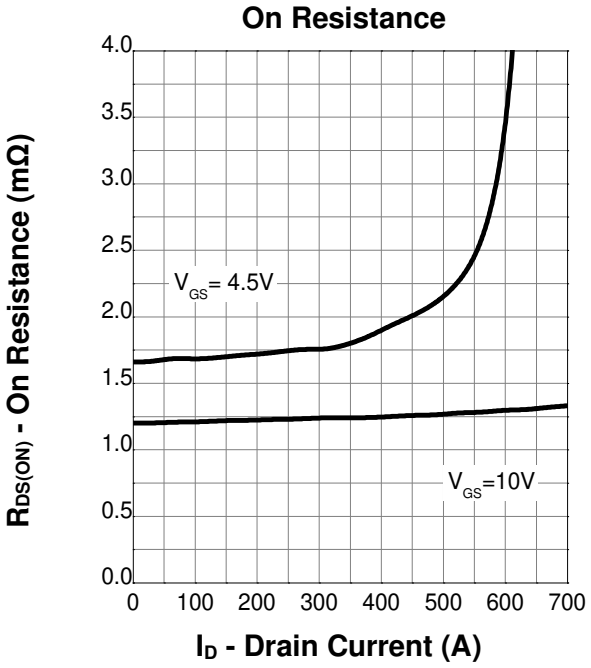


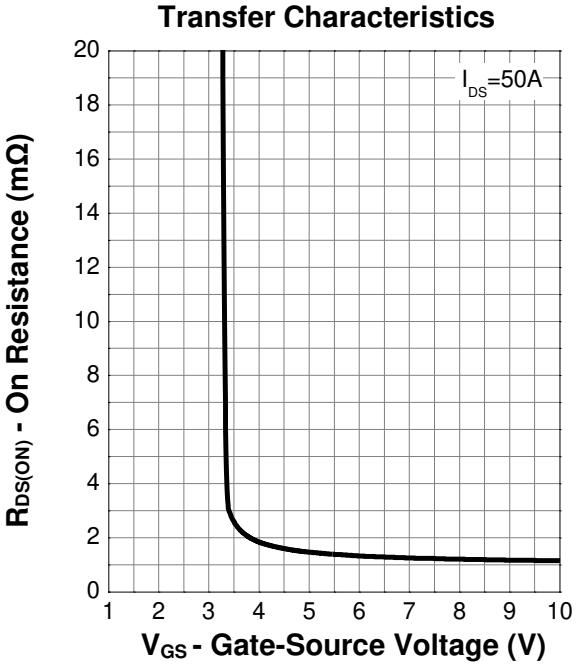


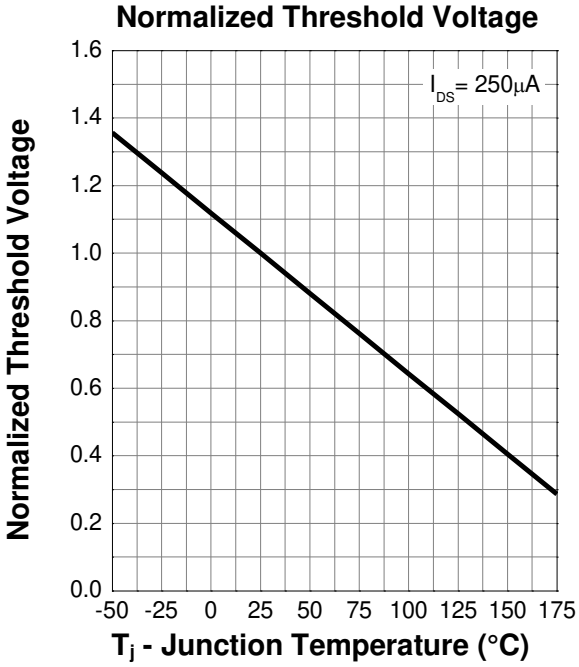


Typical Characteristics (cont.)

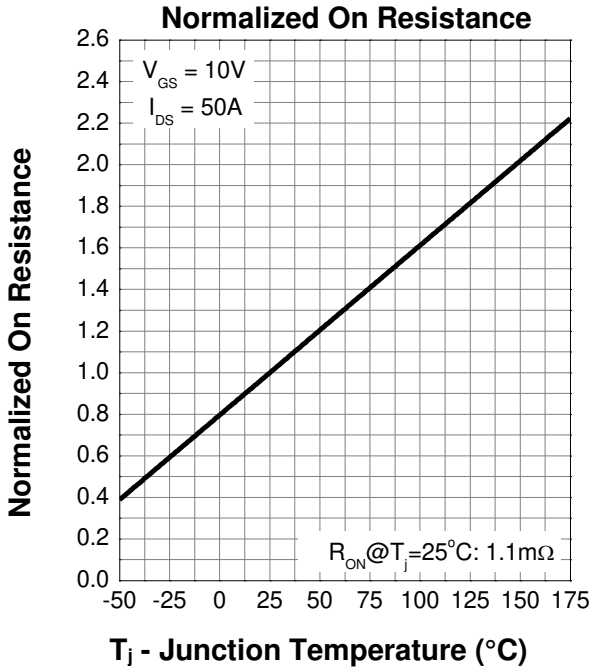


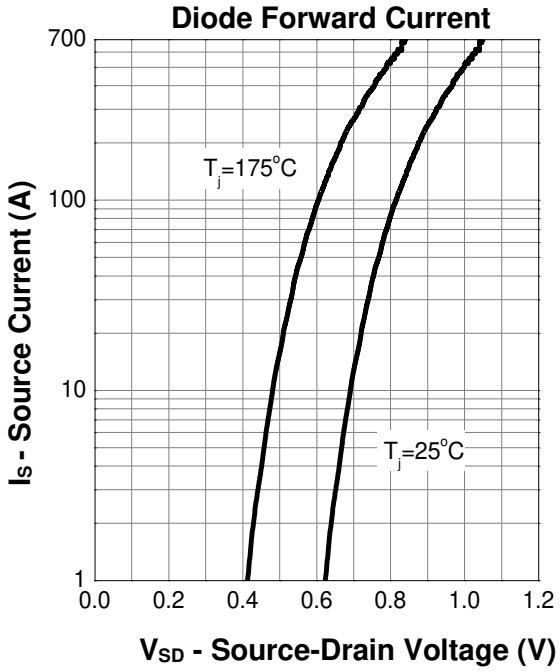


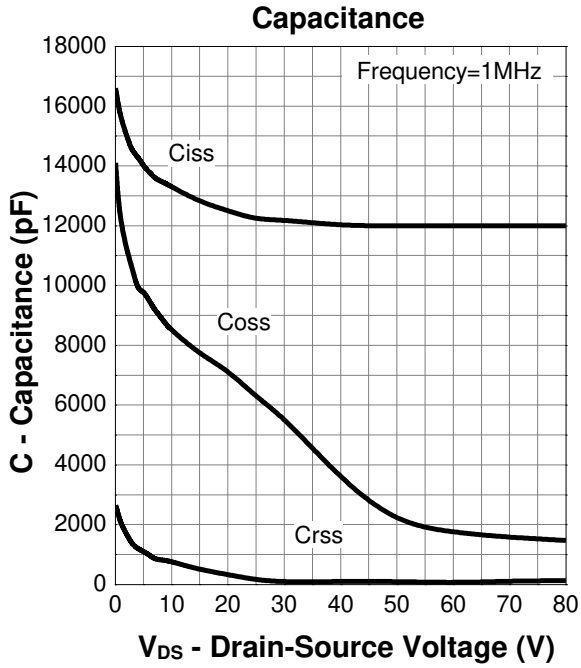


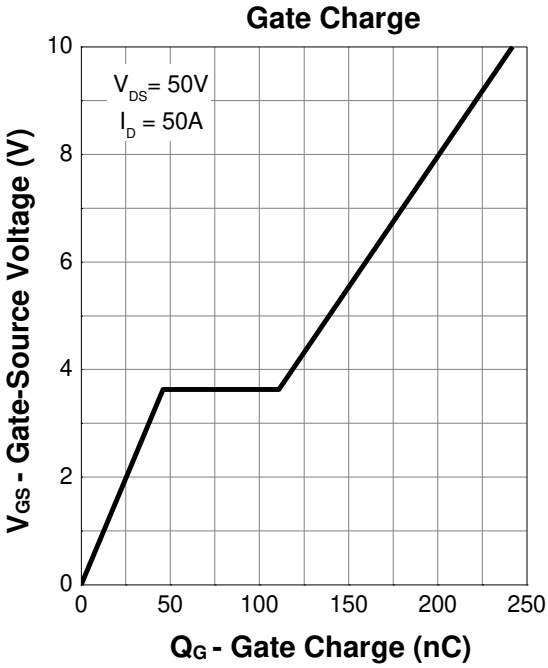


Typical Characteristics (cont.)



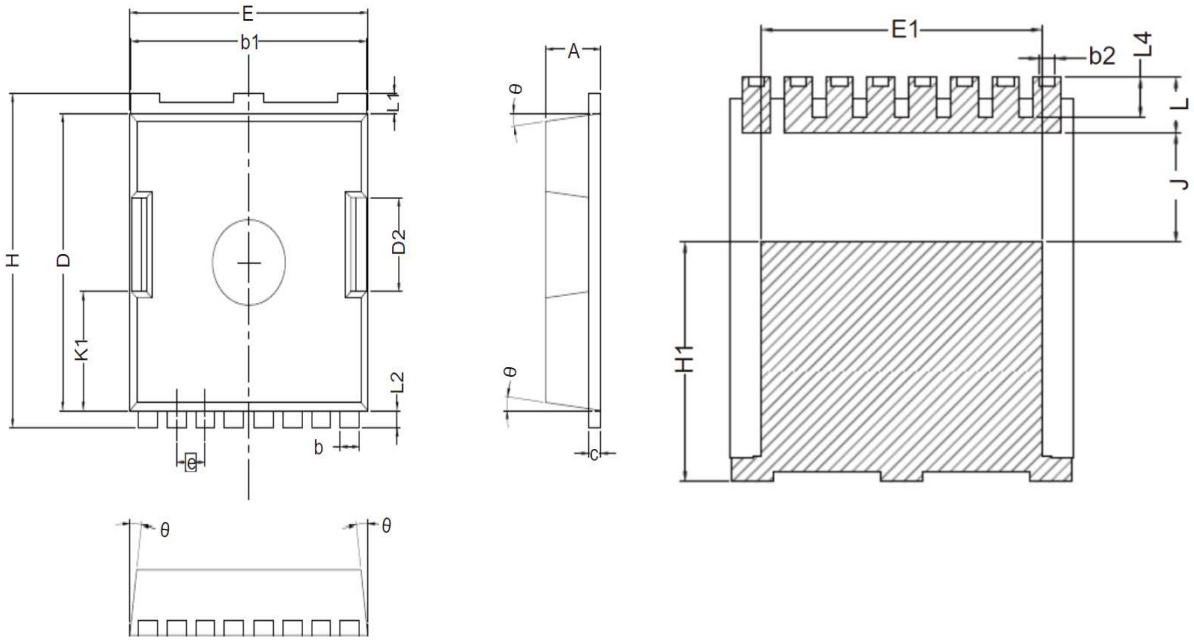






Package Dimensions

TOLL-8L



UNIT	A	b	b 1	b 2	c	D	D2	E	E1	e
mm	2.2	0.9	9.7	0.42	0.42	10.28	3.10	9.70	7.90	1.20 BSC
	2.4	0.9	9.9	0.50	0.60	10.58	3.50	10.10	8.30	

H	H1	J	K1	L	L1	L2	L4	θ
11.48	6.75	3.00	3.98	1.40	0.60	0.50	1.00	4°
11.88	7.15	3.30	4.38	1.80	0.80	0.70	1.30	10°

Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
TOLL-8L	24	4	0.1575	330	12.99	2000

Marking information

" DG10N012LSA " = Part No.

" ****** " = Date Code Marking

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