

**Product Summary**

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
85V	1mΩ@10V	390A



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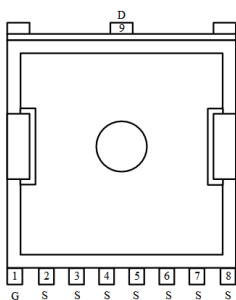
**Feature**

- Fast Switching
- Low Gate Charge and Rdson
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

- Power switching application
- DC-DC Converter
- Power Management

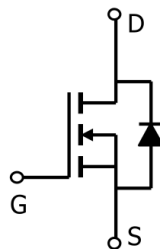
**Applications**

**Package**

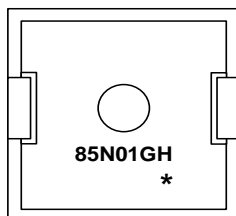


Toll

**Circuit diagram**



**Marking**



85N01GH : Product code  
\* : Month code

**Order Information**

Device	Package	Unite/Tape
SP85N01GHTO	TOLL-8L	2000

**Absolute maximum ratings (Ta=25°C unless otherwise noted)**

Parameter	Symbol	Rating	Unit
Drain source voltage	$V_{DS}$	85	V
Gate source voltage	$V_{GS}$	$\pm 20$	V
Continuous drain current(Tc=25°C)	$I_D$	390	A
Pulsed drain current	$I_{DM}$	1560	A
Power dissipation(Tc=25°C)	$P_D$	500	W
Single pulsed avalanche energy <sup>1)</sup>	$E_{AS}$	3078	mJ
Thermal resistance, junction-case	$R_{\theta JC}$	0.25	°C/W
Operation and storage temperature	$T_{stg}, T_j$	-55 to 150	°C

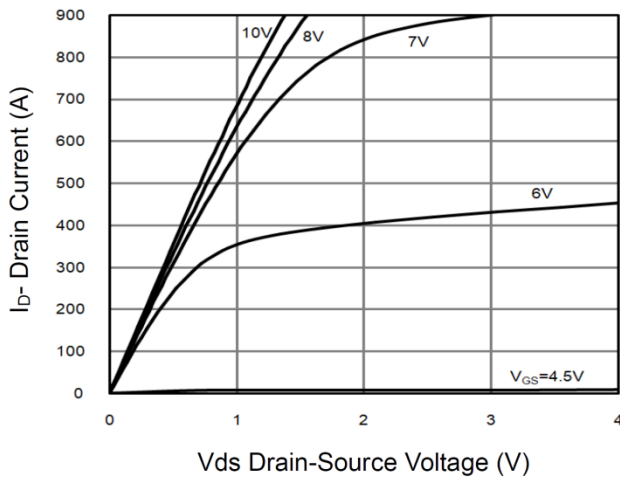
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D = 250\mu A, V_{GS} = 0V$	85	-	-	V
Drain Cut-Off Current	$I_{DSS}$	$V_{DS} = 68V, V_{GS} = 0V$	-	-	1	$\mu A$
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 0.1$	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	3.0	4.0	V
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 20A$	-	1	1.3	m $\Omega$
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 40V, V_{GS} = 0V, f = 1.0MHz$	-	19680	-	pF
Output Capacitance	$C_{oss}$		-	2880	-	
Reverse Transfer Capacitance	$C_{rss}$		-	128	-	
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS} = 40V, V_{GS} = 10V, I_D = 20A$	-	293	-	nC
Gate-Source Charge	$Q_{gs}$		-	78	-	
Gate-Drain Charge	$Q_{gd}$		-	63	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 40V, I_D = 20A, R_G = 1.6\Omega$	-	35	-	ns
Rise Time	$t_r$		-	20	-	
Turn-Off Delay Time	$t_{d(off)}$		-	58	-	
Fall Time	$t_f$		-	21	-	
<b>Drain-Source Body Diode Characteristics</b>						
Source-Drain Diode Forward Voltage	$V_{SD}$	$I_S = 1A, V_{GS} = 0V$	-	-	1.2	V
Reverse Recovery Time	$T_{rr}$	$T_J = 25^\circ C, I_F = 20A$	-	150	-	nS
Reverse Recovery Charge	$Q_{rr}$	$di/dt = 100A/\mu s$	-	390	-	nC

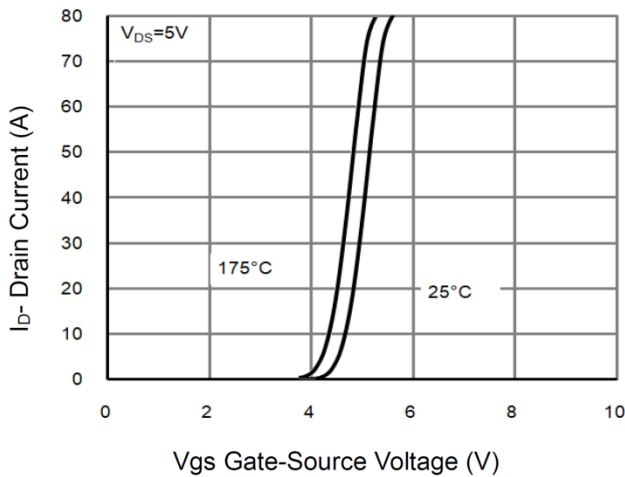
Note:

- $E_{AS}$  is tested at starting  $T_j = 25^\circ C, V_{DD} = 40V, V_{GS} = 10V, L = 0.5mH, R_g = 25m\Omega$ ;

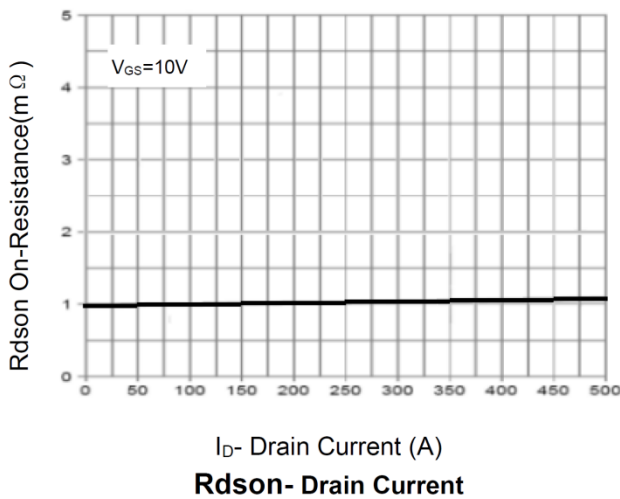
**Typical Characteristics**



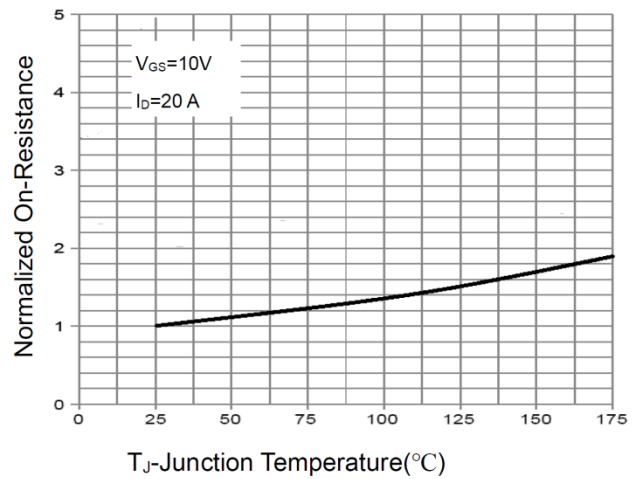
**Output Characteristics**



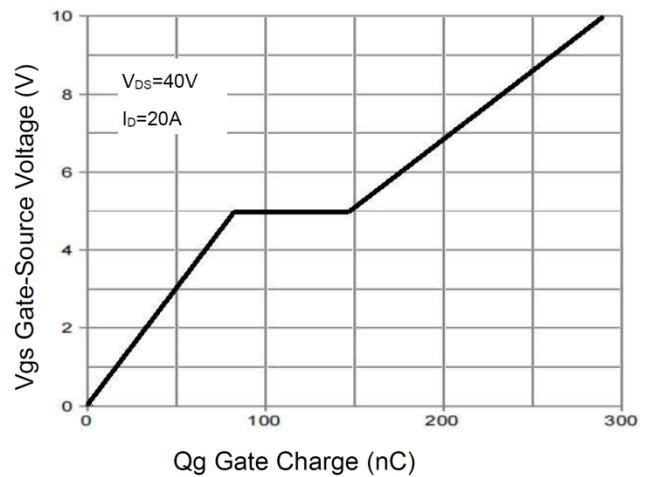
**Transfer Characteristics**



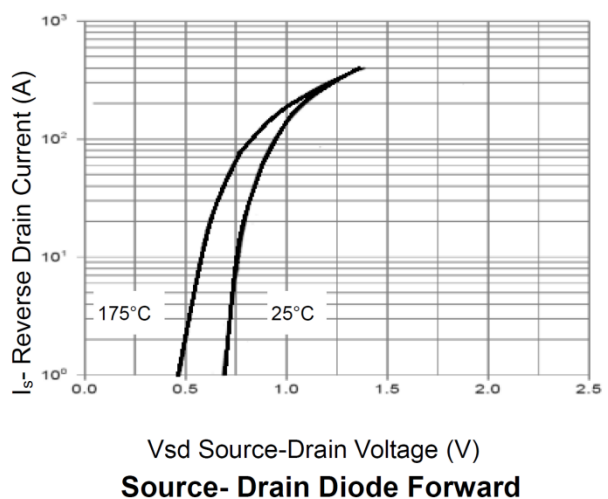
**Rdson- Drain Current**



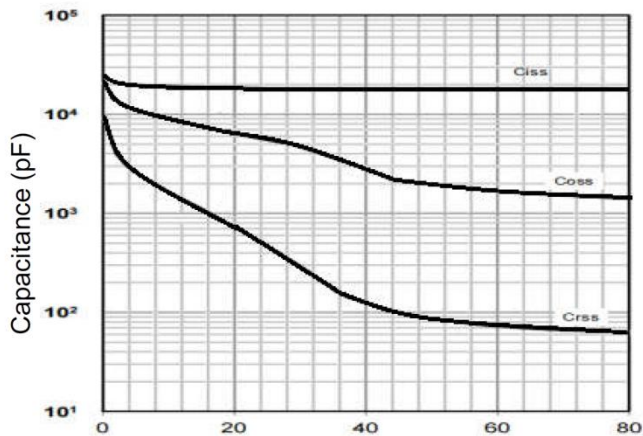
**Rdson-Junction Temperature**



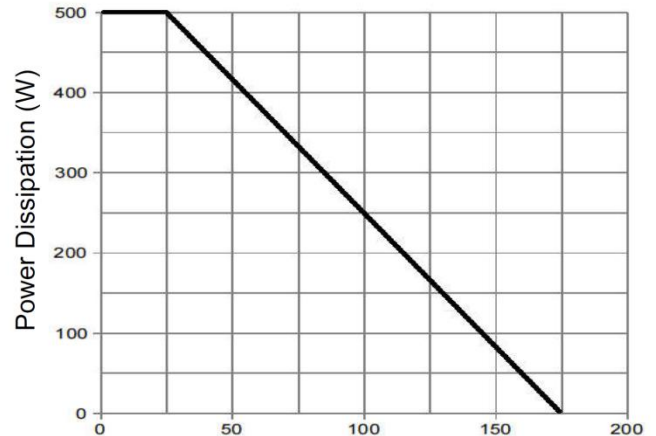
**Gate Charge**



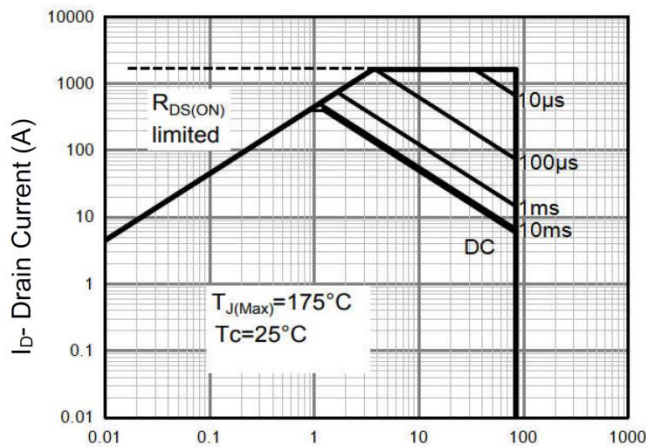
**Source- Drain Diode Forward**



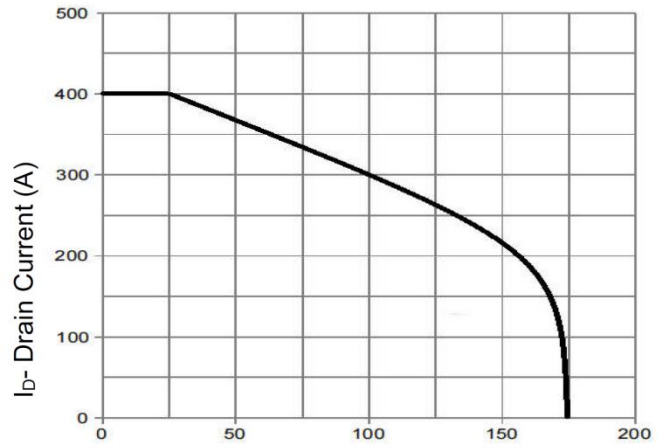
V<sub>ds</sub> Drain-Source Voltage (V)  
**Capacitance vs V<sub>ds</sub>**



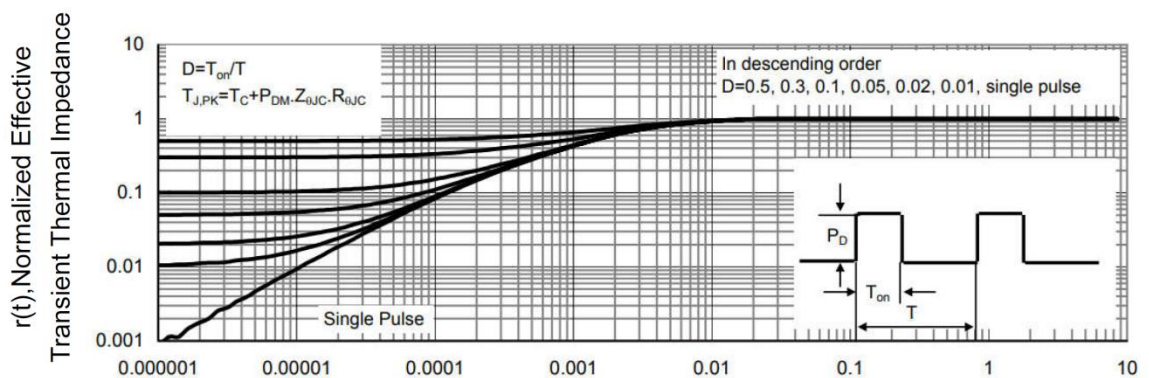
T<sub>J</sub>-Junction Temperature(°C)  
**Power De-rating**



V<sub>ds</sub> Drain-Source Voltage (V)  
**Safe Operation Area**

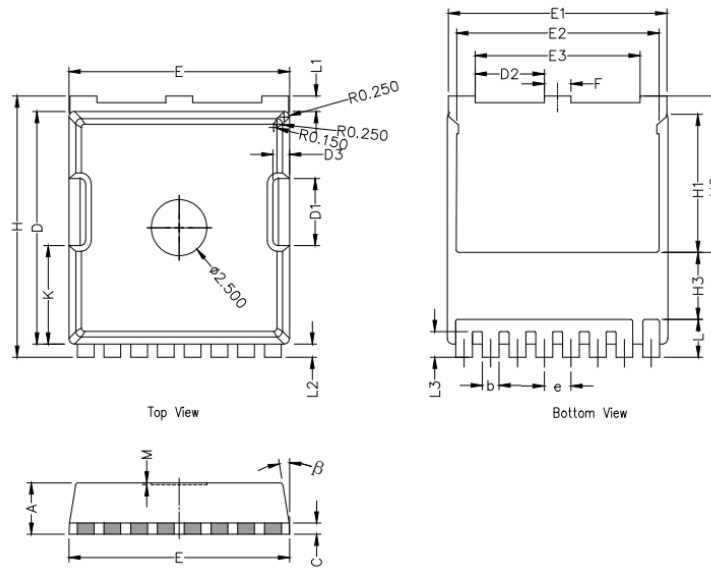


T<sub>J</sub>-Junction Temperature (°C)  
**Current De-rating**



Square Wave Pluse Duration(sec)  
**Normalized Maximum Transient Thermal Impedance**

**TOLL Package Information**



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	2.20	2.30	2.40
b	0.65	0.75	0.85
C	0.508 REF		
D	10.25	10.40	10.55
D1	2.85	3.00	3.15
E	9.75	9.90	10.05
E1	9.65	9.80	9.95
E2	8.95	9.10	9.25
E3	7.25	7.40	7.55
e	1.20 BSC		
F	1.05	1.20	1.35
H	11.55	11.70	11.85
H1	6.03	6.18	6.33
H2	6.85	7.00	7.15
H3	3.00 BSC		
L	1.55	1.70	1.85
L1	0.55	0.7	0.85
L2	0.45	0.6	0.75
M	0.08 REF.		
$\beta$	8°	10°	12°
K	4.25	4.40	4.55

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