

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
40V	1.1mΩ@10V	230A

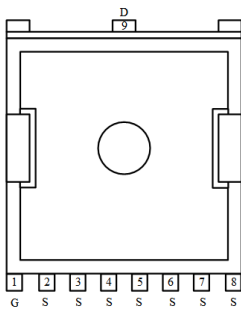
### Feature

- Fast Switching
- Low Gate Charge and R<sub>ds(on)</sub>
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

- PWM Application
- Hard switched and high frequency circuits
- Power Management

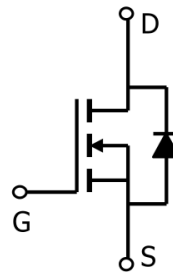
### Applications

### Package

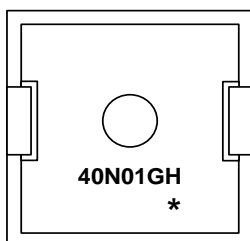


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### Circuit diagram



### Marking



40N01GH =Device Code  
\* =Month Code

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V <sub>DS</sub>	40	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current (Tc=25°C)	I <sub>D</sub>	230	A
Pulsed Drain Current	I <sub>DM</sub>	920	A
Single Pulse Avalanche Energy <sup>1</sup>	E <sub>AS</sub>	1402	mJ
Total Power Dissipation <sup>2</sup> (Tc=25°C)	P <sub>D</sub>	293	W
Thermal Resistance Junction-Case	R <sub>θJC</sub>	0.43	°C/W
Storage Temperature Range	T <sub>STG</sub>	-55 to 150	°C
Operating Junction Temperature Range	T <sub>J</sub>	-55 to 150	°C

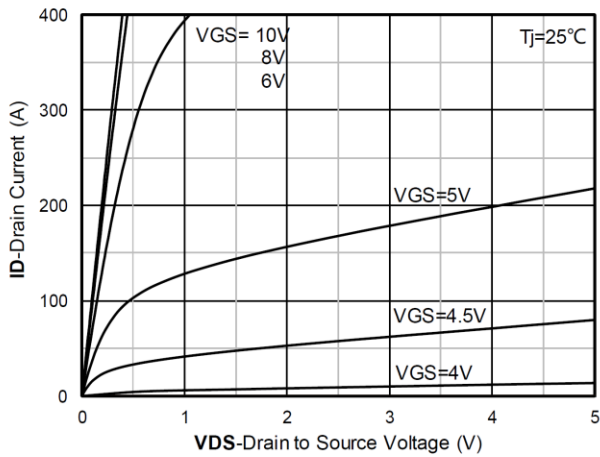
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	40	---	---	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =32V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	2.0	3.0	4.0	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =50A	---	1.1	1.5	mΩ
<b>Dynamic characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f=1MHz	---	5165	---	pF
Output Capacitance	C <sub>oss</sub>		---	1954	---	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	122	---	
<b>Switching Characteristics</b>						
Total Gate Charge (4.5V)	Q <sub>g</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =10V, I <sub>D</sub> =85A	---	85		nC
Gate-Source Charge	Q <sub>gs</sub>		---	32		
Gate-Drain Charge	Q <sub>gd</sub>		---	12.5		
Turn-On Delay Time	T <sub>d(on)</sub>	V <sub>DD</sub> =20V, V <sub>GS</sub> =10V, R <sub>G</sub> =1.6Ω, I <sub>D</sub> =85A	---	13.5	---	ns
Rise Time	T <sub>r</sub>		---	8.8	---	
Turn-Off Delay Time	T <sub>d(off)</sub>		---	52	---	
Fall Time	T <sub>f</sub>		---	9.6	---	
<b>Diode Characteristics</b>						
Diode Forward Voltage <sup>2</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	---	---	1.2	V

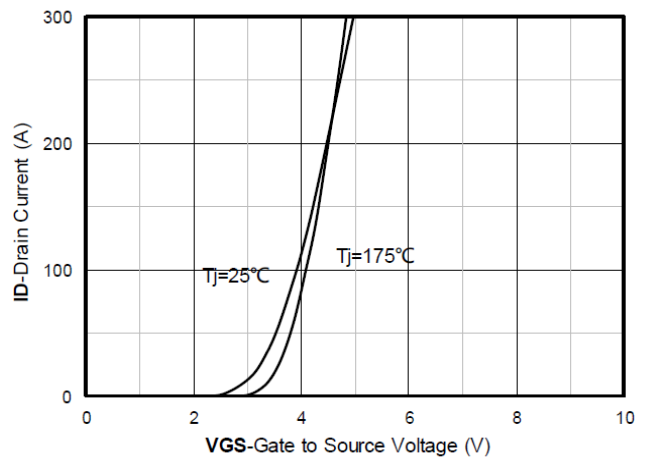
**Note :**

- The EAS data shows Max. rating . The test condition is V<sub>DD</sub>=20V, V<sub>GS</sub>=10V, L=0.5mH, R<sub>G</sub>=25Ω
- The power dissipation is limited by 150°C junction temperature

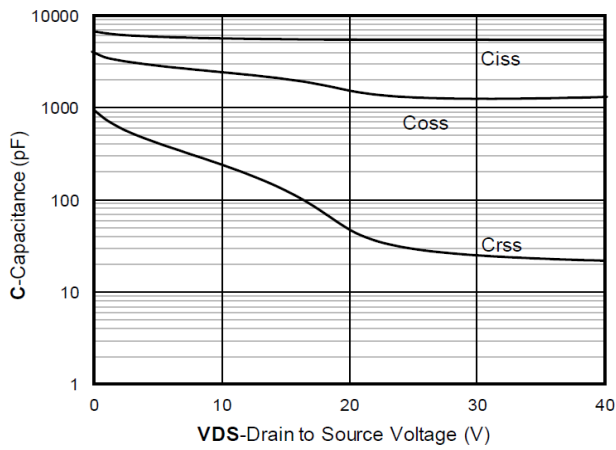
**Typical Characteristics**



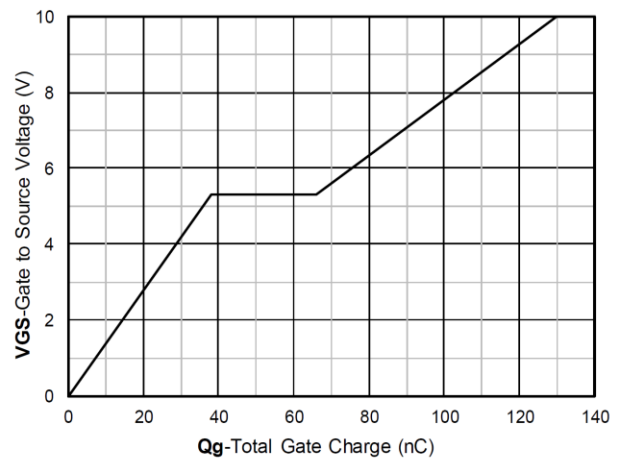
Output Characteristics



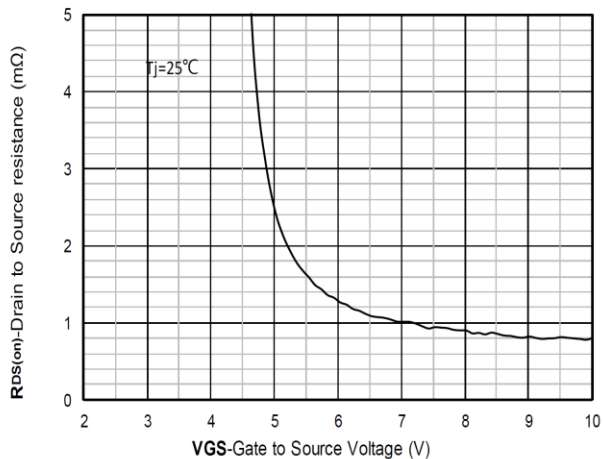
Transfer Characteristics



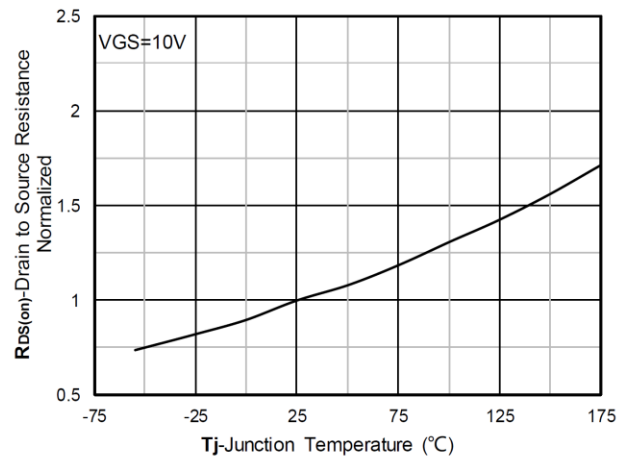
Capacitance Characteristics



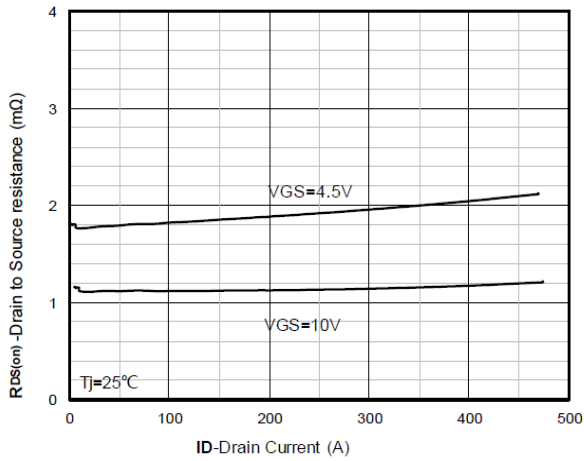
Gate Charge



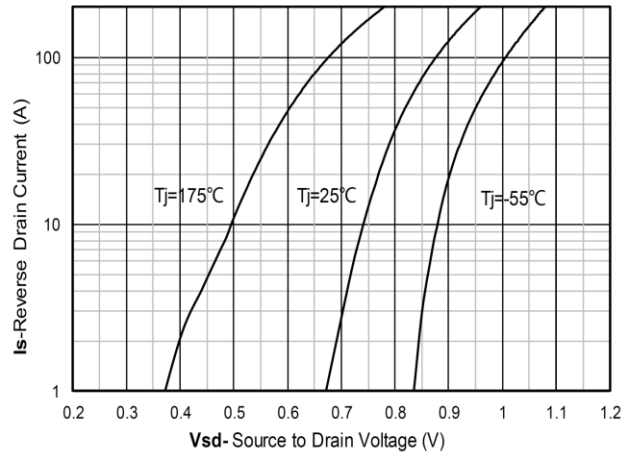
On-Resistance vs Gate to Source Voltage



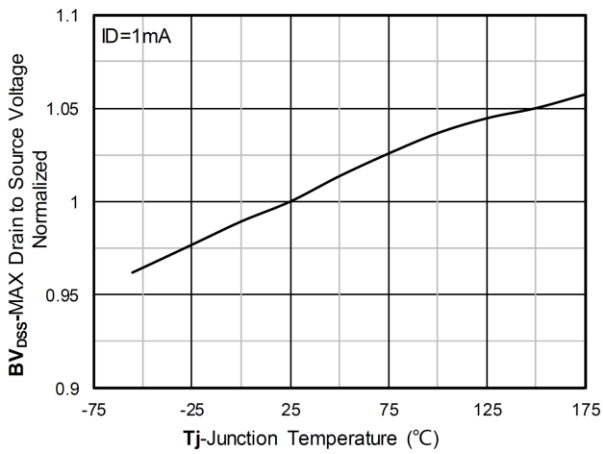
Normalized On-Resistance



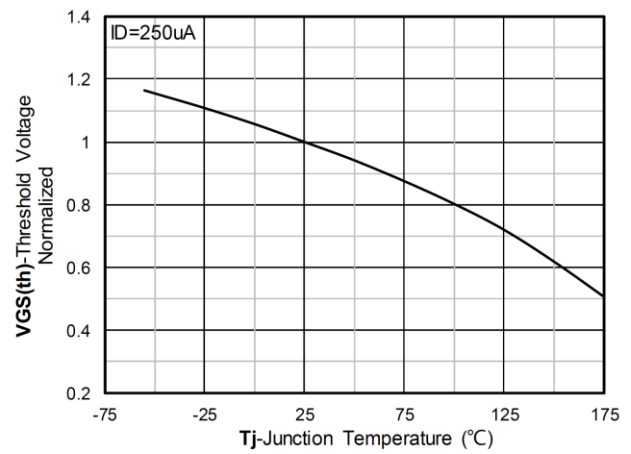
RDS(on) VS Drain Current



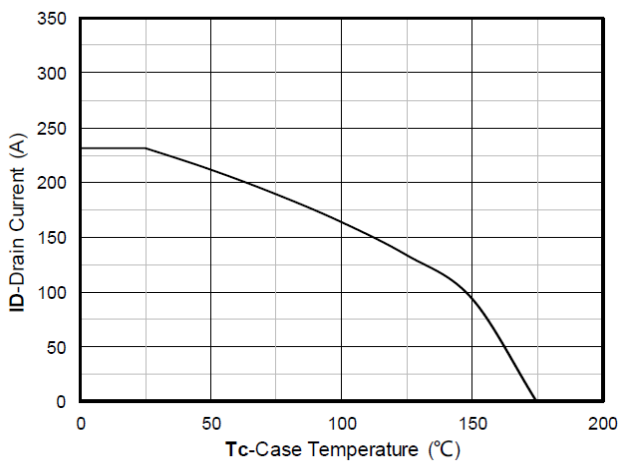
Forward characteristics of reverse diode



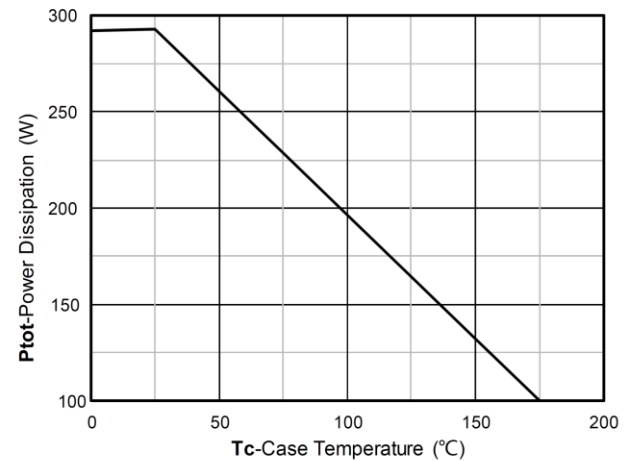
Normalized breakdown voltage



Normalized Threshold voltage



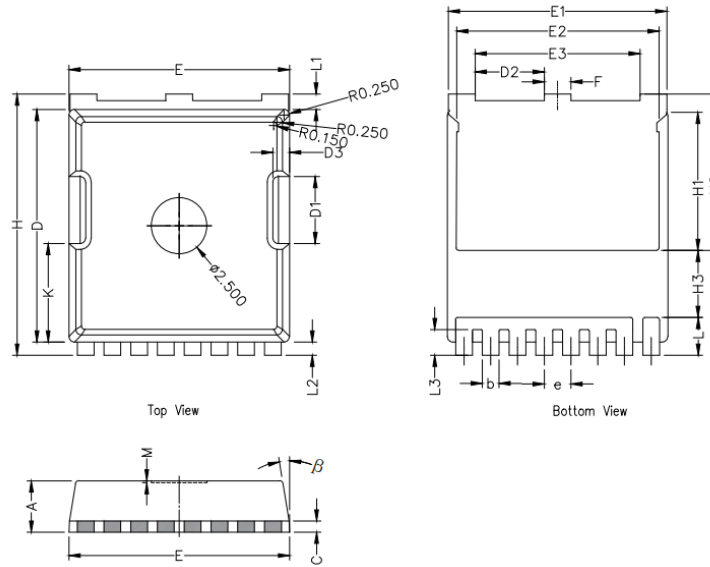
Current dissipation



Power dissipation



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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