

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
40V	1.5mΩ@10V	180A
	2mΩ@4.5V	

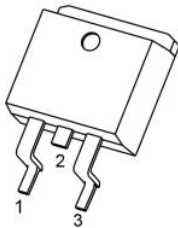
### Feature

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

### Applications

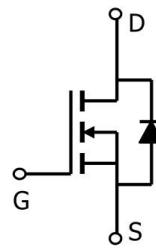
- PWM Application
- Hard switched and high frequency circuits
- Power Management

### Package



TO-263(1:G 2:D 3:S)

### Circuit diagram



### Marking



**40N01G**      =Device Code  
**\*\***                =Week Code

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	$V_{DS}$	40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current(Tc=25°C)	$I_D$	180	A
Pulsed Drain Current	$I_{DM}$	720	A
Single Pulse Avalanche Energy <sup>1</sup>	$E_{AS}$	420	mJ
Total Power Dissipation <sup>2</sup> (Tc=25°C)	$P_D$	230	W
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.54	°C/W
Storage Temperature Range	$T_{STG}$	-55 to 150	°C
Operating Junction Temperature Range	$T_J$	-55 to 150	°C

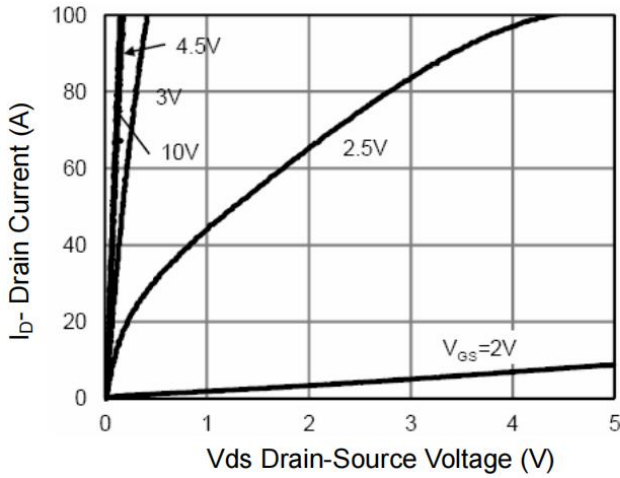
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	40	---	---	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=32V, V_{GS}=0V, T_J=25^\circ C$	---	---	1	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1.4	1.9	2.4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=30A$	---	1.5	1.9	m $\Omega$
		$V_{GS}=4.5V, I_D=20A$	---	2	2.7	
<b>Dynamic characteristics</b>						
Total Gate Charge (4.5V)	$Q_g$	$V_{DS}=20V, V_{GS}=10V, I_D=85A$	---	128	---	nC
Gate-Source Charge	$Q_{gs}$		---	19	---	
Gate-Drain Charge	$Q_{gd}$		---	12	---	
Input Capacitance	$C_{iss}$	$V_{DS}=20V, V_{GS}=0V, f=1MHz$	---	7515	---	pF
Output Capacitance	$C_{oss}$		---	1854	---	
Reverse Transfer Capacitance	$C_{rss}$		---	122	---	
<b>Switching Characteristics</b>						
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=20V, V_{GS}=10V, R_G=1.6\Omega, I_D=85A$	---	13.5	---	ns
Rise Time	$T_r$		---	8.8	---	
Turn-Off Delay Time	$T_{d(off)}$		---	52	---	
Fall Time	$T_f$		---	9.6	---	
<b>Diode Characteristics</b>						
Diode Forward Voltage <sup>2</sup>	$V_{SD}$	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	---	---	1.2	V

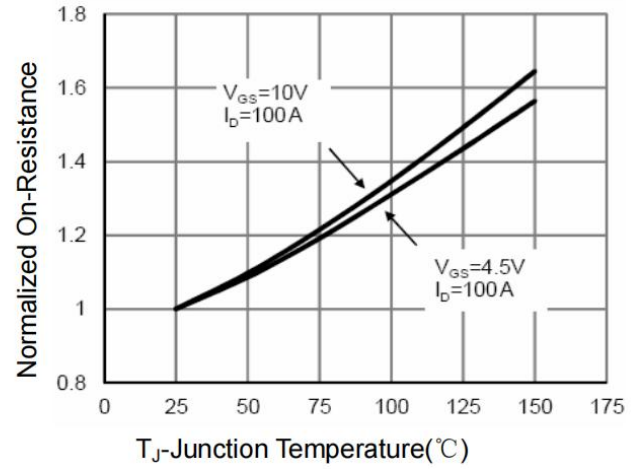
**Note :**

- The EAS data shows Max. rating . The test condition is  $V_{DD}=20V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$
- The power dissipation is limited by 150°C junction temperature

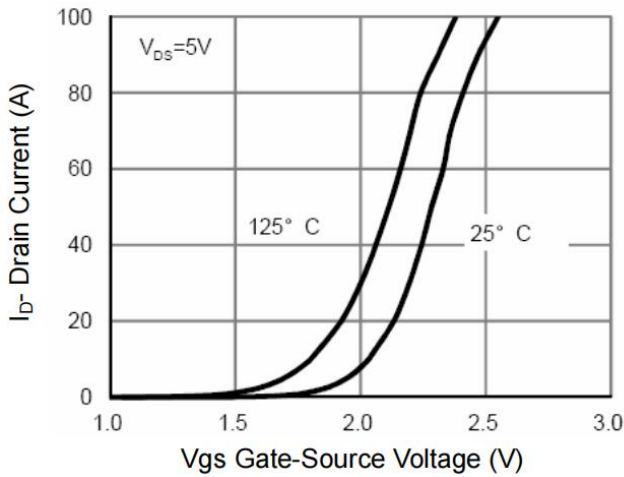
**Typical Characteristics**



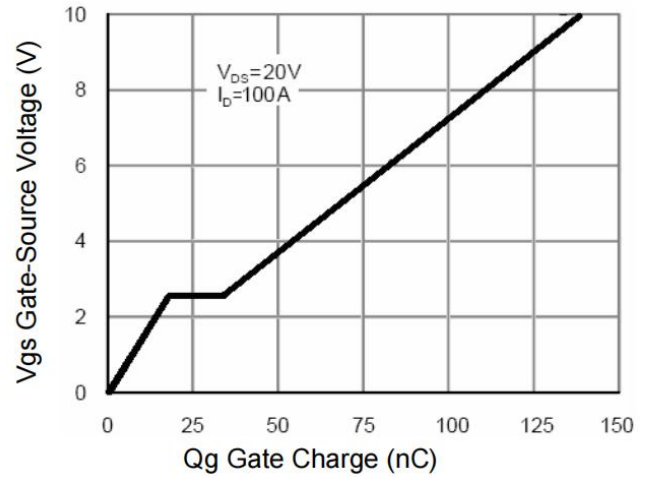
**Output Characteristics**



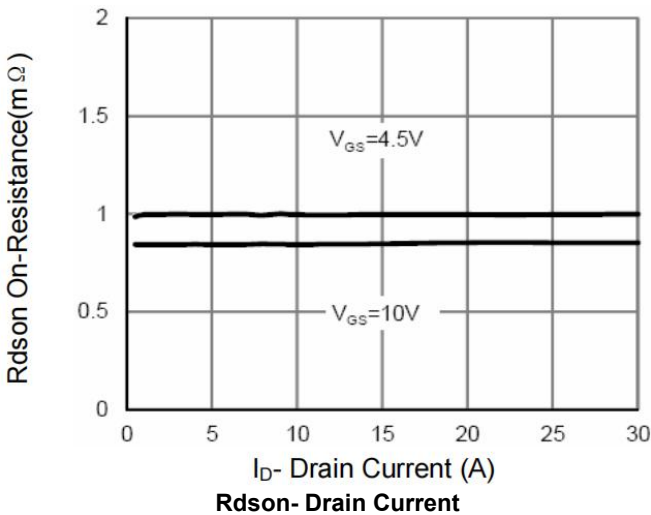
**Rdson-Junction Temperature**



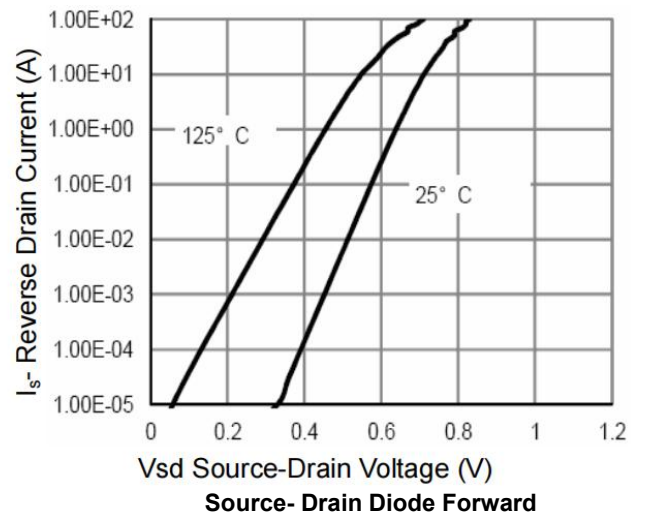
**Transfer Characteristics**



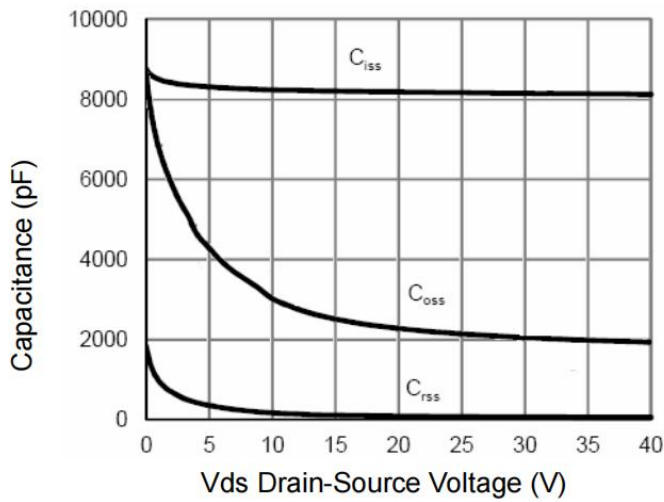
**Gate Charge**



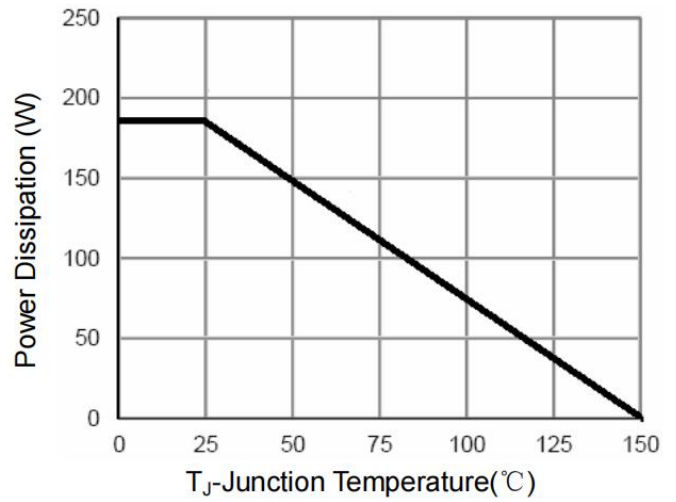
**Rdson- Drain Current**



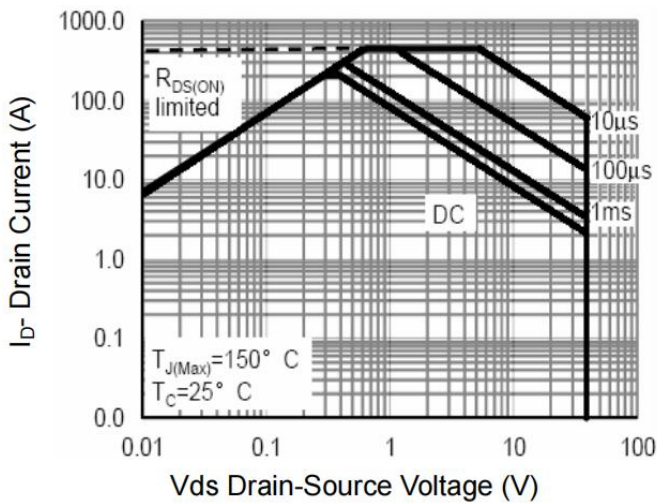
**Source- Drain Diode Forward**



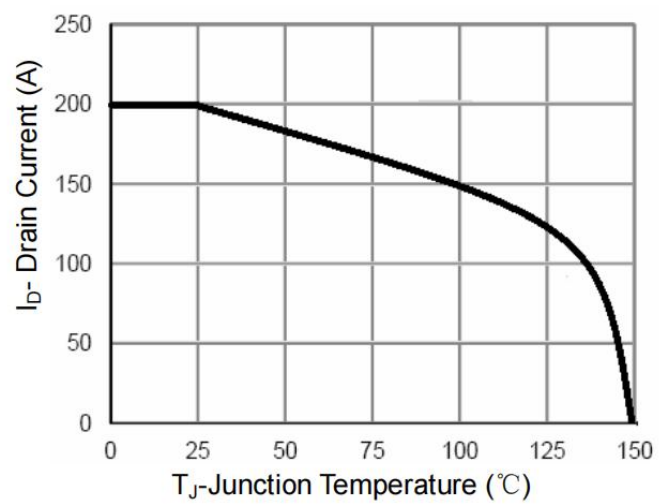
Capacitance vs Vds



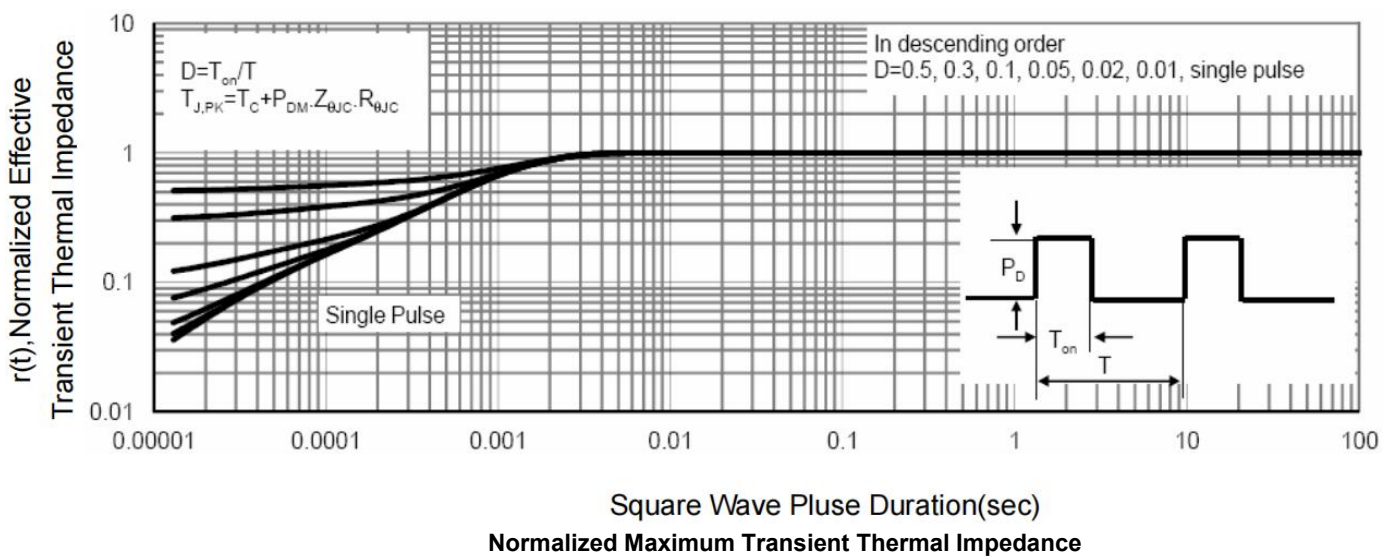
Power De-rating



Safe Operation Area



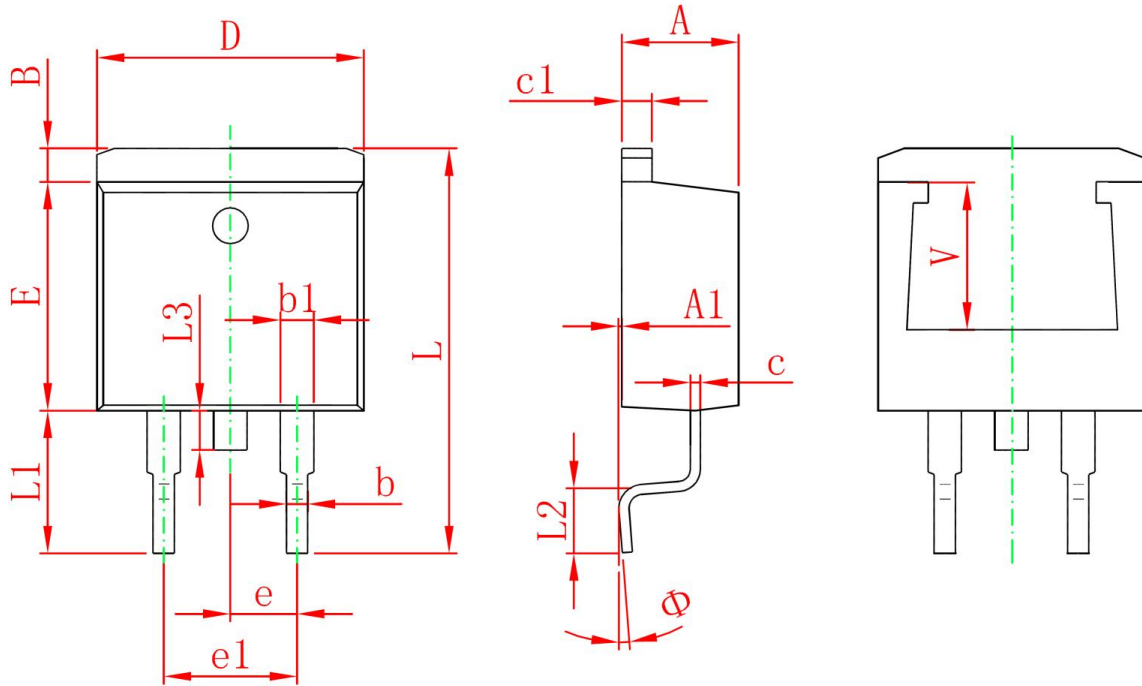
Current De-rating



Normalized Maximum Transient Thermal Impedance



TO-263 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.950	5.450	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
$\Phi$	0°	8°	0°	8°
V	5.600 REF.		0.220 REF.	

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