

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	1.7mΩ@10V	140A
	2.2mΩ@4.5V	

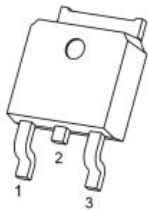
Feature

- Fast Switching
- Low Gate Charge and Rds on
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

Applications

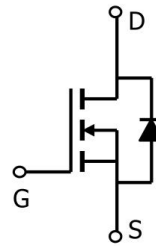
- PWM Application
- Hard switched and high frequency circuits
- Power Management

Package



TO-252(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}	± 20	V
Continuous Drain Current (Tc=25°C, Package limit)	I_D	140	A
Continuous Drain Current (Tc=25°C, Silicon limit)	I_D	220	A
Pulsed Drain Current	I_{DM}	1040	A
Single Pulse Avalanche Energy ¹	E_{AS}	420	mJ
Total Power Dissipation ² (Tc=25°C)	P_D	155	W
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.8	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

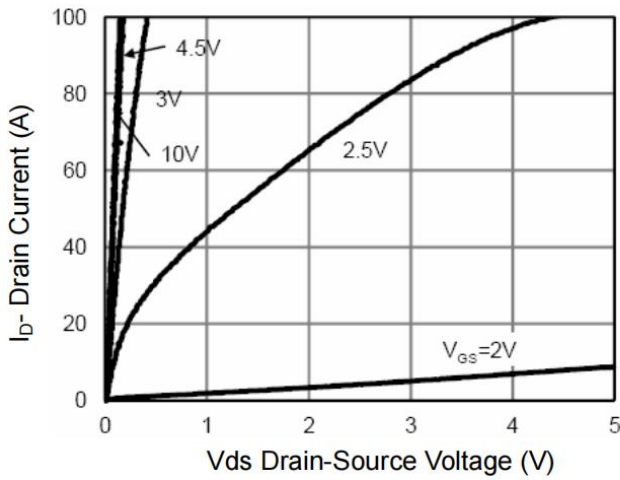
Electrical characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
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	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 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	$R_{DS(on)}$	$V_{GS}=10V, I_D=30A$	---	1.7	2.2	m Ω
		$V_{GS}=4.5V, I_D=20A$	---	2.2	3	
Dynamic characteristics						
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	---	
Switching Characteristics						
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	---	
Diode Characteristics						
Diode Forward Voltage ²	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^\circ C$	---	---	1.2	V

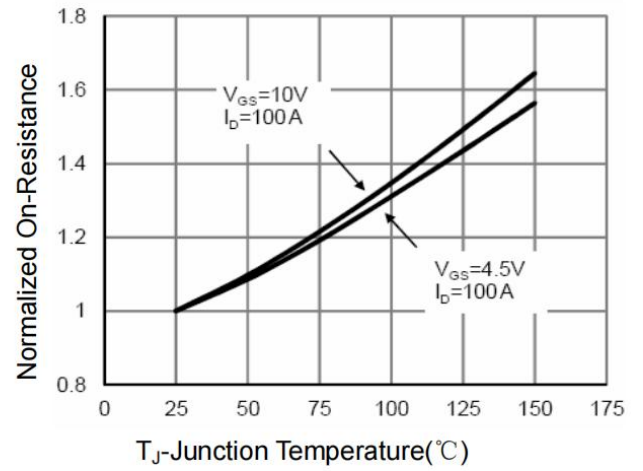
Note :

- 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

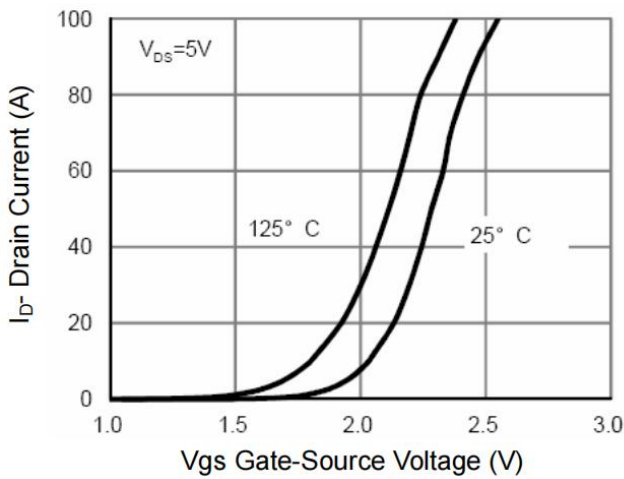
Typical Characteristics



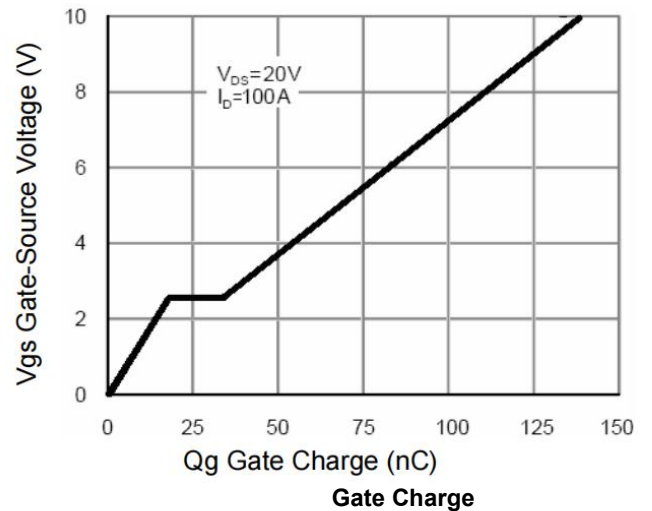
Output Characteristics



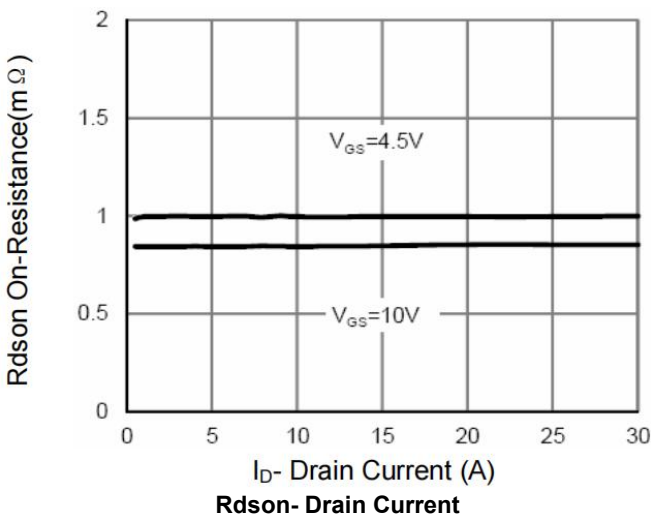
Rdson-Junction Temperature



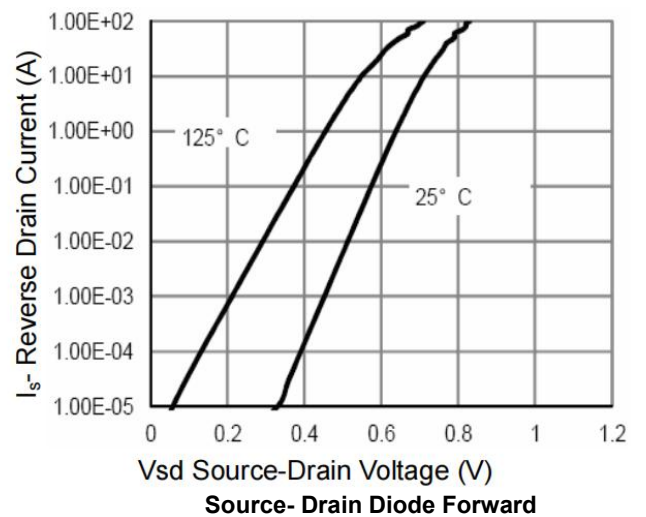
Transfer Characteristics



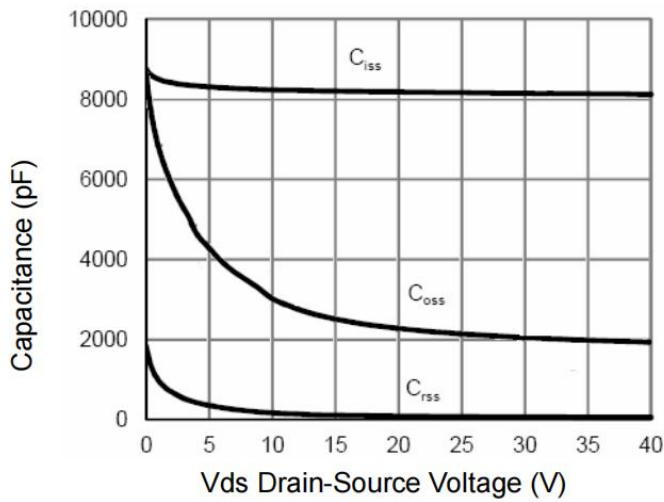
Gate Charge



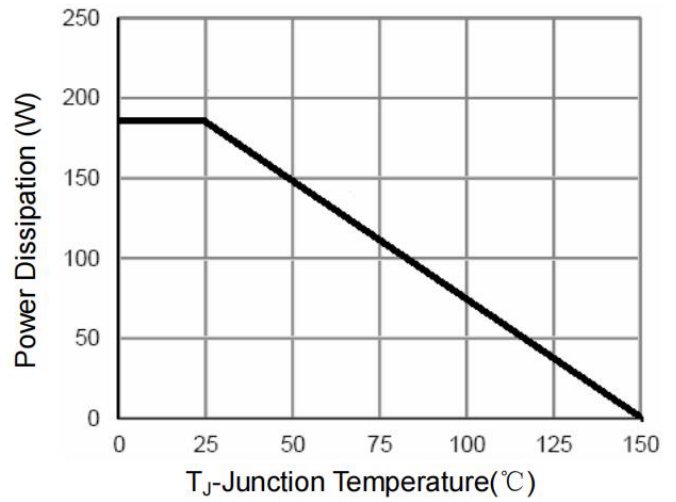
Rdson- Drain Current



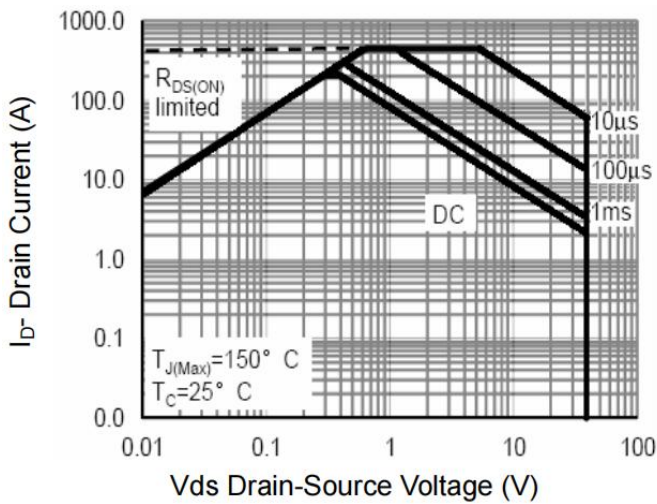
Source- Drain Diode Forward



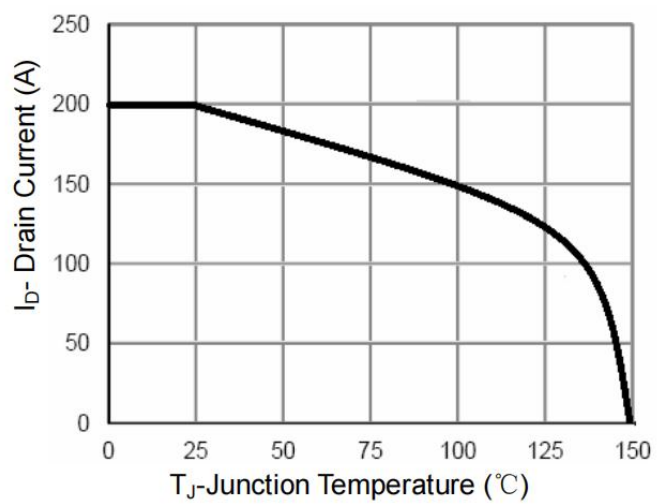
Capacitance vs Vds



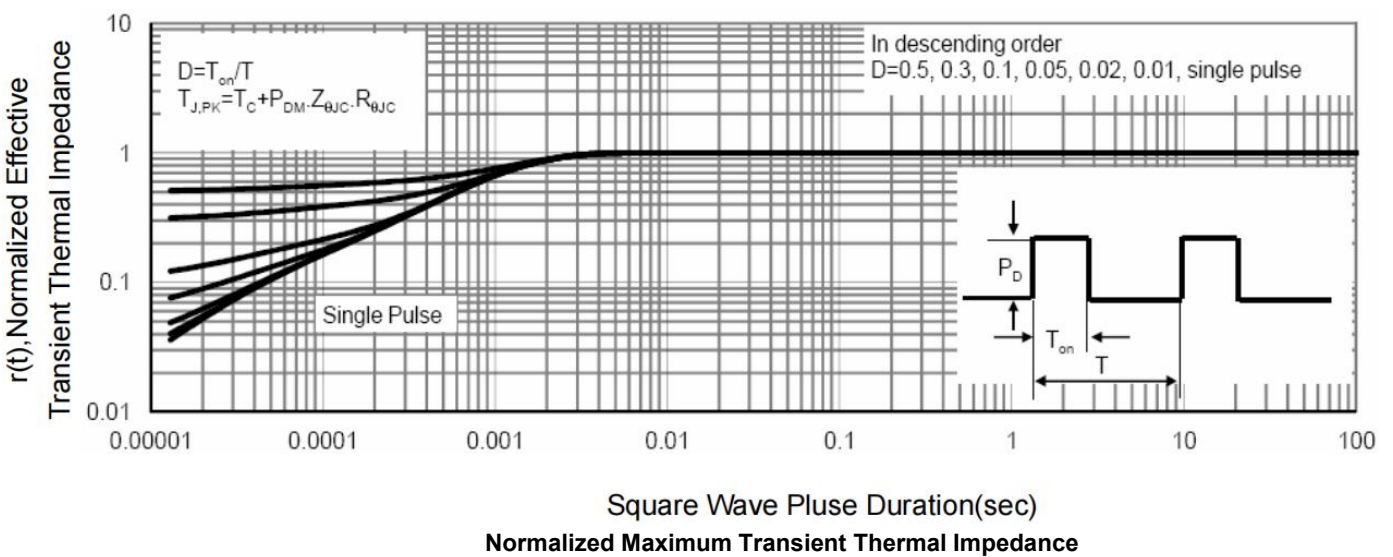
Power De-rating



Safe Operation Area



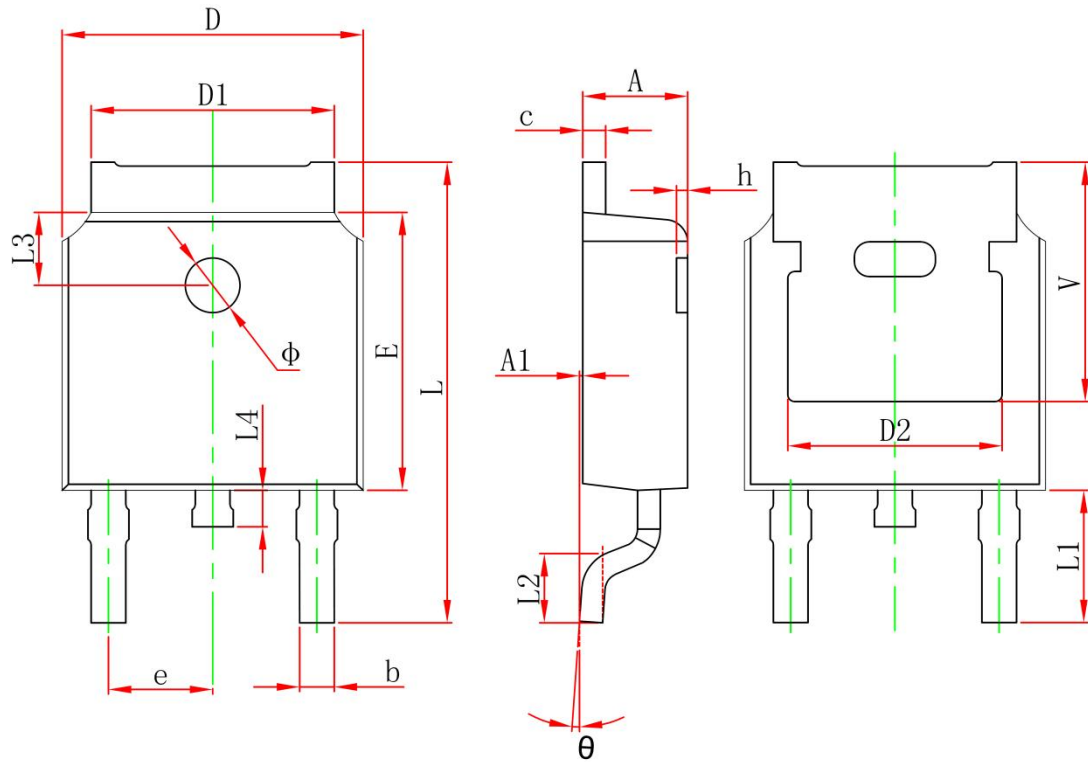
Current De-rating



Normalized Maximum Transient Thermal Impedance



TO-252 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 REF.		0.211 REF.	

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