Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	3.5mΩ@10V	120A
	5.5mΩ@4.5V	

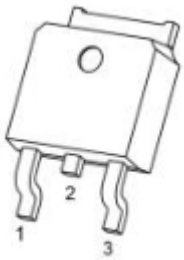
Feature

- V_{DS} =40V,I_D =120A
- $R_{DS(ON)}$ <5mΩ @ V_{GS}=10V
  $R_{DS(ON)}$ <8mΩ @ V_{GS}=4.5V
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation
- 100% Single Pulse avalanche energy Test

Application

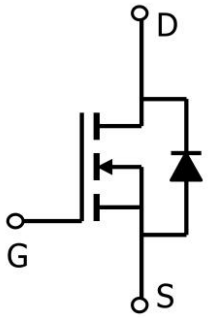
- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package



TO-252(G:1 D:2 S:3)

Circuit diagram



Marking

40N03B : Product code
**** : Week code.**

Absolute maximum ratings

(T_a=25℃ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25℃	I_D	120	A
Pulsed Drain Current [1]		I_{DM}	480	A
Single Pulsed Avalanche Energy [2]		E_{AS}	506	mJ
Power Dissipation	T_C = 25℃	P_D	110	W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	1.13	℃/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to 175	℃

Electrical characteristics

(T_A=25℃, unless otherwise noted)

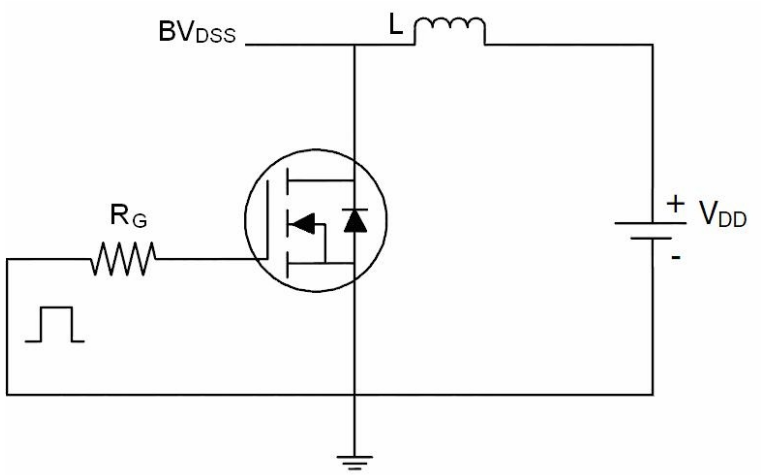
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$BV_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =40V,V_{GS} = 0V			1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS} =±20V , V_{DS}=0V			±100	uA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1.0	1.6	2.5	V
Static Drain-Source on-Resistance[3]	$R_{DS(on)}$	V_{GS} =10V, I_D =20A		3.5	5	mΩ
		V_{GS} =4.5V, I_D =10A		5.5	8	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, f=1MHz		5595		pF
Output Capacitance	C_{oss}			811		
Reverse Transfer Capacitance	C_{rss}			340		
Total Gate Charge	Q_g	V_{DS}=20V, V_{GS}=10V, I_D =20A		85		pF
Gate-Source Charge	Q_{gs}			12.5		
Gate-Drain Charge	Q_{gd}			20		
Switching Characteristics						
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=20V, I_D =20A, R_L=1Ω, R_{GEN}=3Ω, V_{GS}=10V		15		nS
Rise Time	T_r			16		
Turn-Off Delay Time	$T_{d(off)}$			49		
Fall Time	T_f			15		
Diode Characteristics						
Drain to Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=1A			1.2	V
Body Diode Reverse Recovery Time	t_{rr}	T_J=25℃,I_F=20A, dI/dt=100A/μs		42		ns
Body Diode Reverse Recovery Charge	Q_{rr}			55		nC

Note：

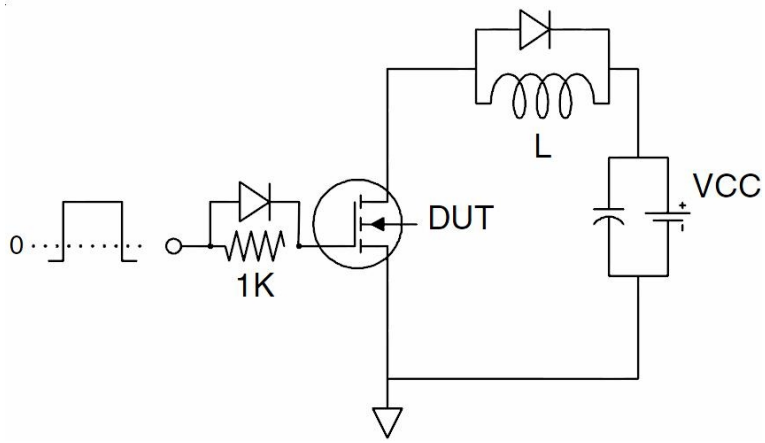
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. E_{AS} condition: T_J=25℃, V_{DD}=20V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=45A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Test Circuits

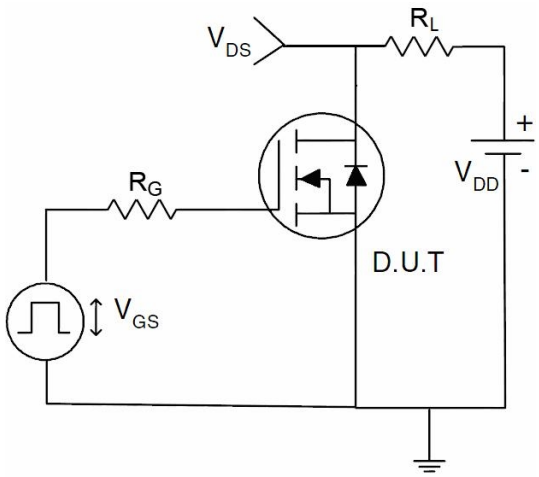
- EAS Test Circuits



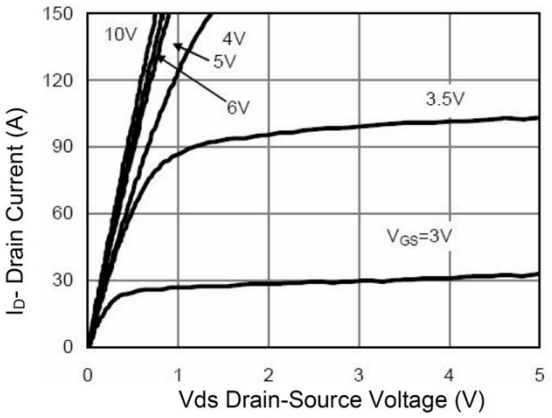
- Gate Charge Test Circuit



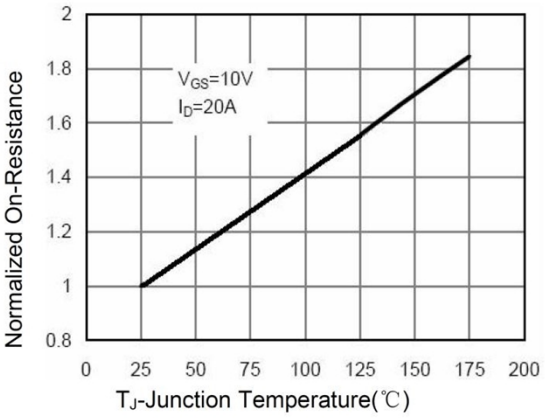
- Switch Time Test Circuit



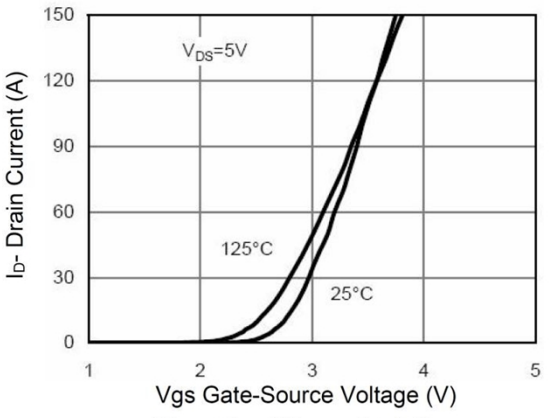
Typical Characteristics



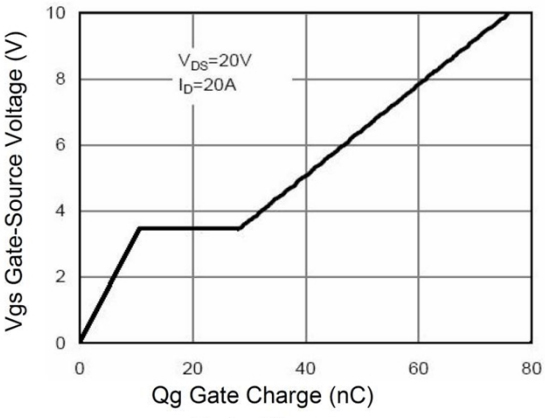
Output Characteristics



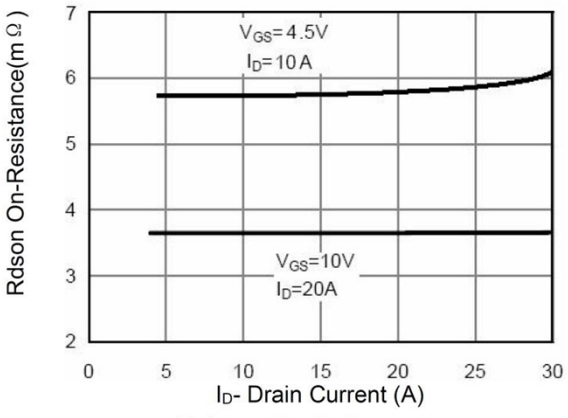
Rdson-JunctionTemperature



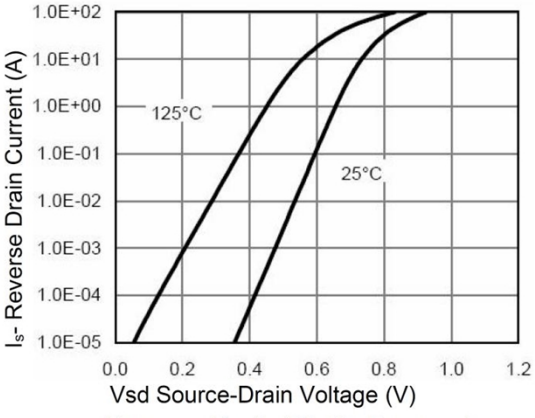
Transfer Characteristics



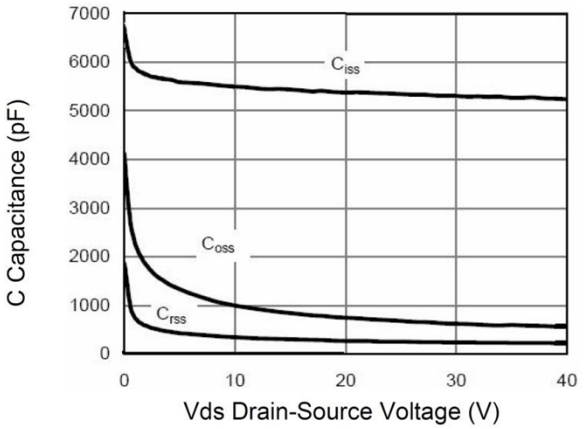
Gate Charge



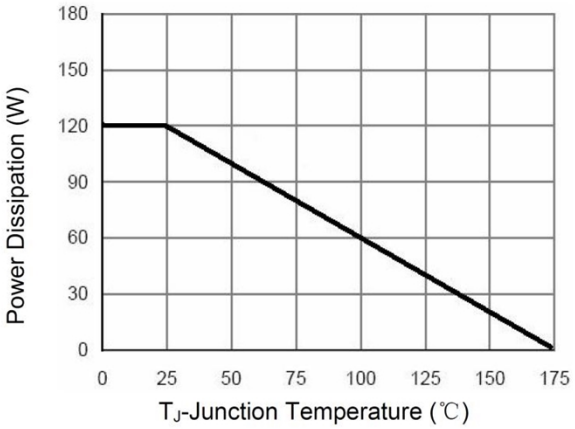
Rdson- Drain Current



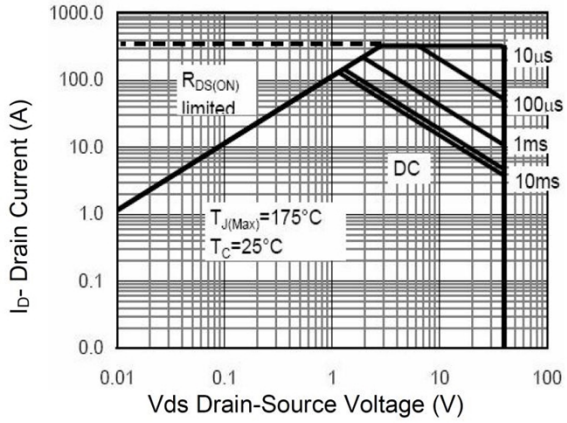
Source- Drain Diode Forward



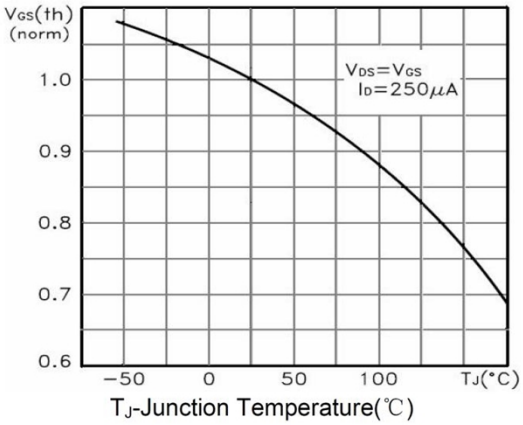
Capacitance vs Vds



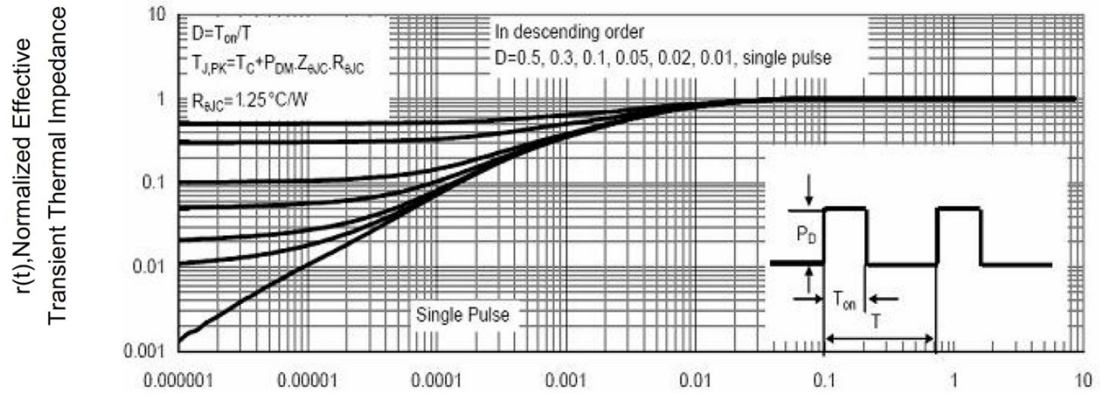
Power De-rating



Safe Operation Area

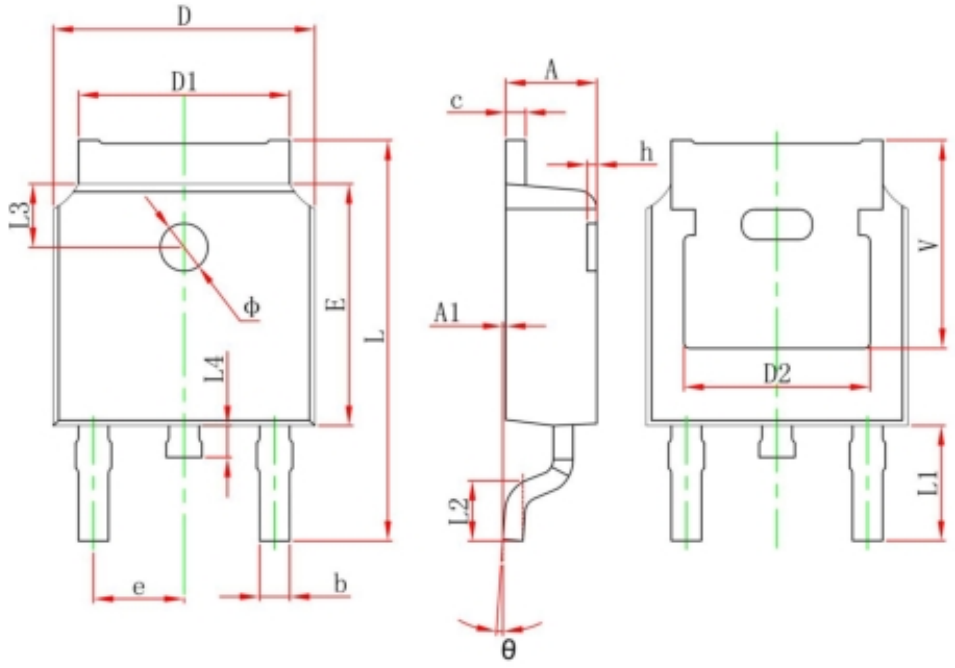


$V_{GS(th)}$ vs Junction Temperature



Normalized Maximum Transient Thermal Impedance

TO-252 Package Information



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.	