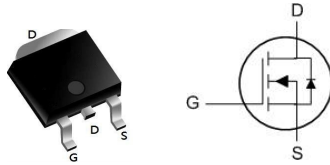


Super Low Gate Charge
Green Device Available
Excellent Cdv/dt effect decline
Advanced high cell density Trench technology

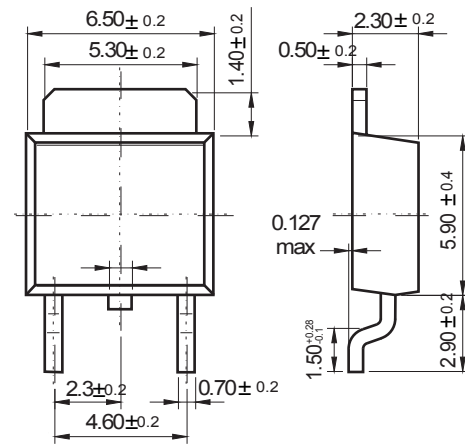


Product Summary

BVDSS	RDSON	ID
100V	20mΩ	40A

TO-252

Unit: mm



Dimensions in inches and (millimeters)

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	100	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Continuous Drain Current, V _{GS} @ 10V ¹	40	A
I _D @T _C =100°C	Continuous Drain Current, V _{GS} @ 10V ¹	20	A
I _{DM}	Pulsed Drain Current ²	80	A
EAS	Single Pulse Avalanche Energy ³	40	mJ
I _{AS}	Avalanche Current	30	A
P _D @T _C =25°C	Total Power Dissipation ³	43.7	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-ambient ¹	---	50	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	---	3.0	°C/W

40N10

Electrical Characteristics (T_J = 25°C, unless otherwise noted)

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	100	-	-	V
Gate-body Leakage current		I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T _J =25°C	I _{DSS}	V _{DS} =100V, V _{GS} = 0V	-	-	1	μA
	T _J =100°C			-	-	100	
Gate-Threshold Voltage		V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.0		3.0	V
Drain-Source on-Resistance ⁴		R _{DS(on)}	V _{GS} = 10V, I _D = 8 A	-	20	28	mΩ
			V _{GS} = 4.5V, I _D = 4 A	-	23	31	
Forward Transconductance ⁴		g _{fs}	V _{DS} =5V , I _D =5A	-	12	-	S
Dynamic Characteristics ⁵							
Input Capacitance		C _{iss}	V _{DS} = 15V, V _{GS} =0V, f =1MHz	-	822	-	pF
Output Capacitance		C _{oss}		-	320	-	
Reverse Transfer Capacitance		C _{rss}		-	23	-	
Gate Resistance		R _g	f =1MHz	-	1.3	-	Ω
Switching Characteristics ⁵							
Total Gate Charge		Q _g	V _{GS} = 10V, V _{DS} = 50V, I _D =5A	-	40.6	-	nC
Gate-Source Charge		Q _{gs}		-	8	-	
Gate-Drain Charge		Q _{gd}		-	6.7	-	
Turn-On Delay Time		t _{d(on)}	V _{GS} =10V, V _{DD} =50V, R _G = 3Ω, I _D = 5A	-	8.7	-	ns
Rise Time		t _r		-	41	-	
Turn-Off Delay Time		t _{d(off)}		-	40	-	
Fall Time		t _f		-	32	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ⁴		V _{SD}	I _S = 1A, V _{GS} = 0V	-	-	1.2	V
Continuous Source Current	T _C =25°C	I _S	-	-	-	40	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
3. The EAS data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=8A
4. The power dissipation is limited by 150°C junction temperature
5. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

RATING AND CHARACTERISTIC CURVES (40N10)

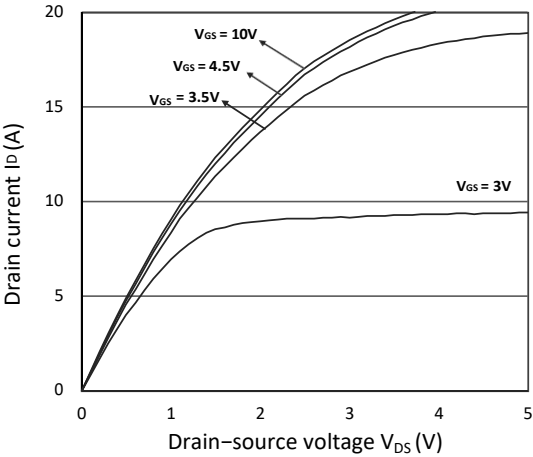


Figure 1. Output Characteristics

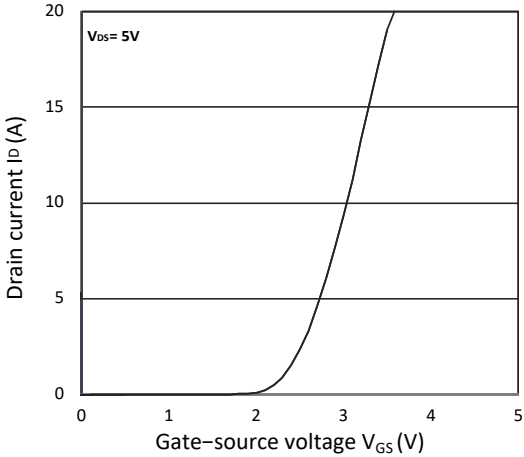


Figure 2. Transfer Characteristics

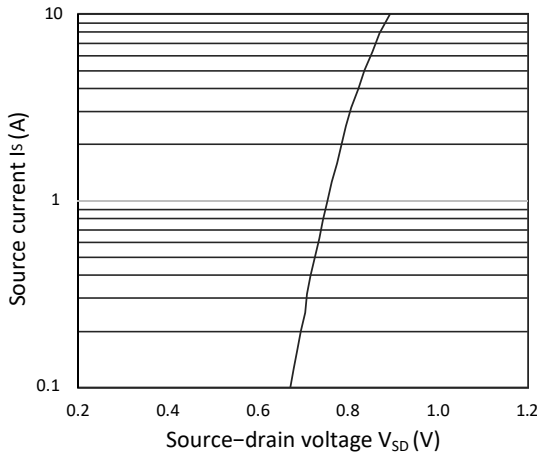


Figure 3. Forward Characteristics of Reverse

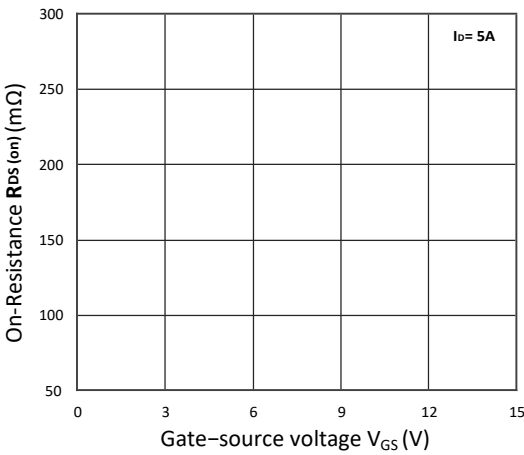


Figure 4. $R_{DS(on)}$ vs. V_{GS}

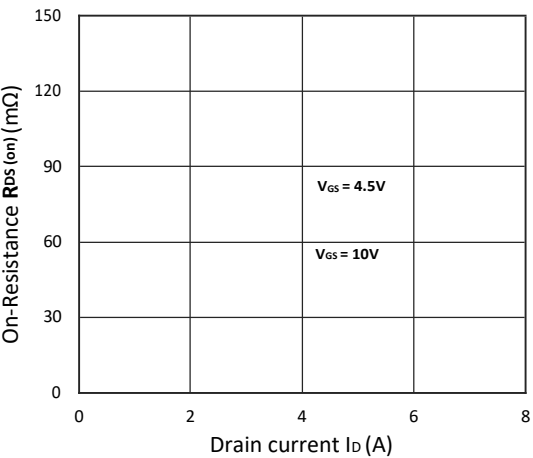


Figure 5 $R_{DS(on)}$ vs I_D

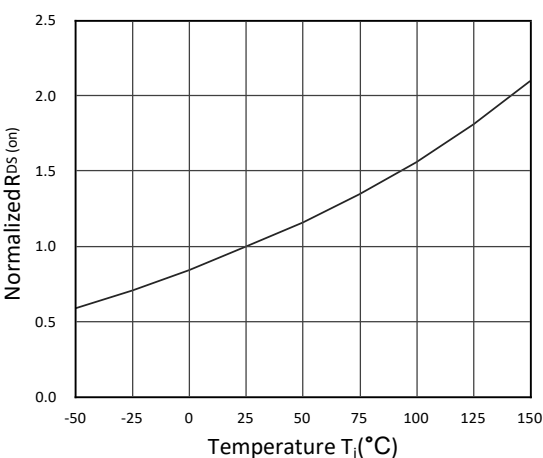


Figure 6 Normalized $R_{DS(on)}$ vs Temperature

RATING AND CHARACTERISTIC CURVES (40N10)

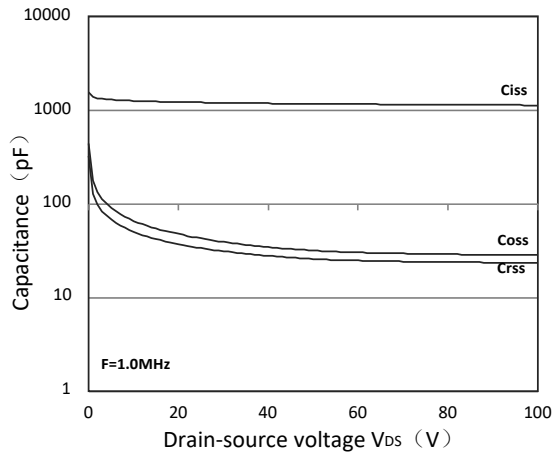


Figure 7. Capacitance Characteristics

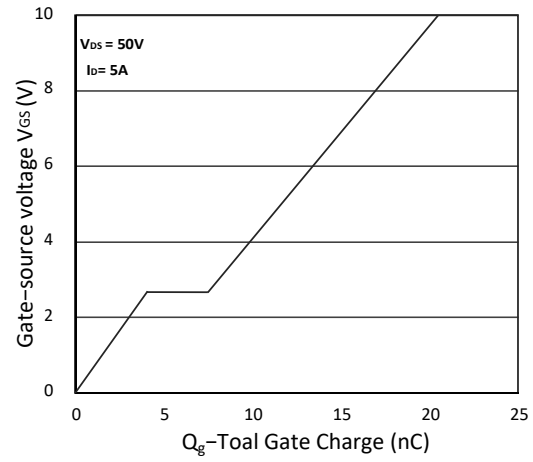


Figure 8. Gate Charge Characteristics

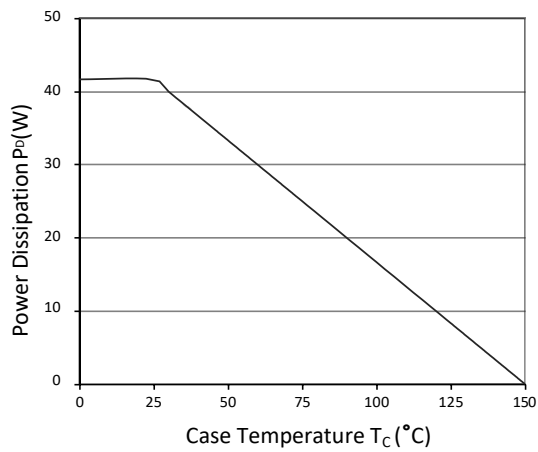


Figure 9. Power Dissipation

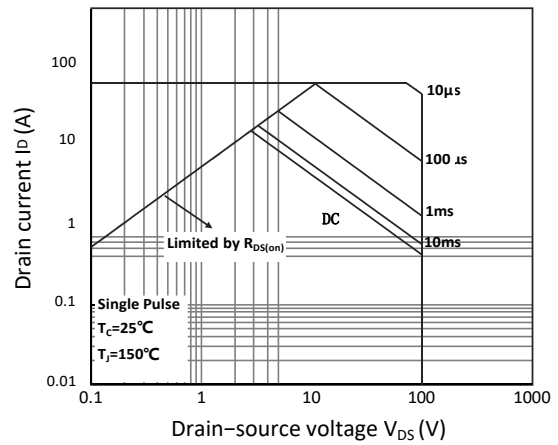


Figure 10. Safe Operating Area

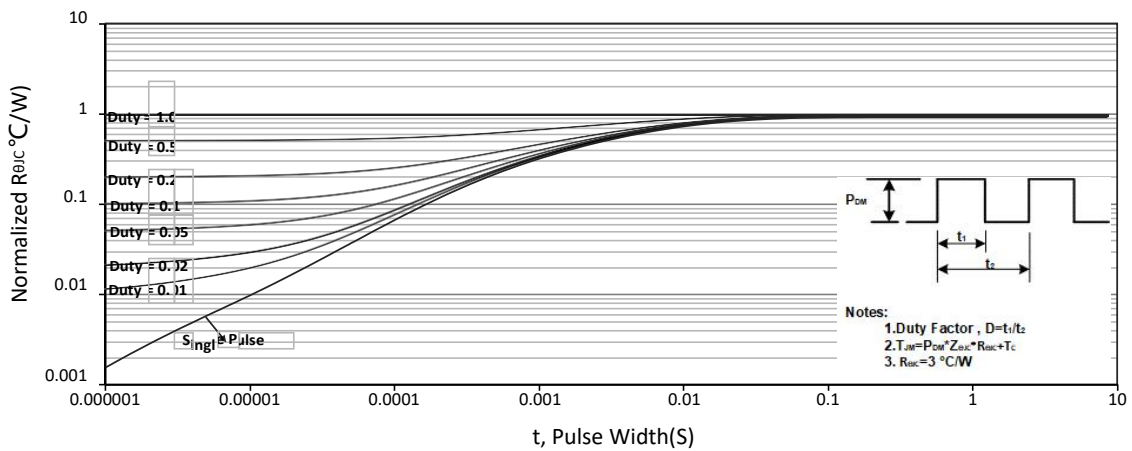


Figure 11. Normalized Maximum Transient Thermal Impedance