

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	0.9mΩ@10V	330A

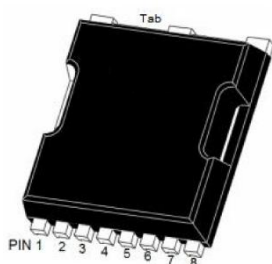
Feature

- Fast Switching
- Low Gate Charge and $R_{DS(on)}$
- Advanced Split Gate Trench Technology
- Suffix "-Q1" for AEC-Q101

Application

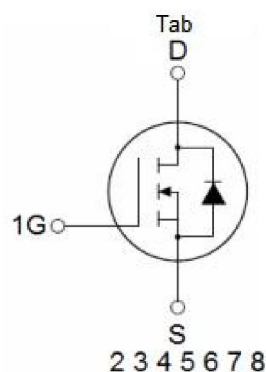
- PWM Application
- Hard switched and high frequency circuits
- Power Management

Package

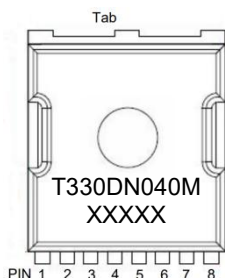


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Circuit diagram



Marking



Absolute maximum ratings ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	330	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	220	A
Pulsed Drain Current	I_{DM}	1320	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	175	W
Single Pulse Avalanche Energy ¹⁾	E_{AS}	1681	mJ
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.86	$^{\circ}\text{C}/\text{W}$
Junction Temperature	T_J	175	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +175$	$^{\circ}\text{C}$

Electrical characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

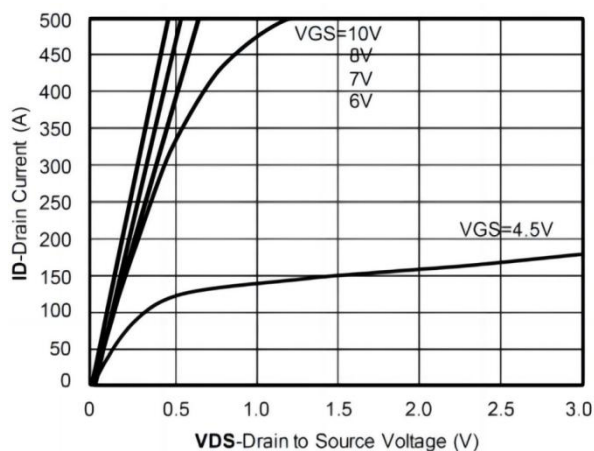
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =32V,V _{GS} =0V,T _J =25°C			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	2.9	4	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =50A		0.75	0.9	mΩ
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =25V,V _{GS} =0V, f =1MHz		6953		pF
Output Capacitance	C _{oss}			4264		
Reverse Transfer Capacitance	C _{rss}			184		
Total Gate Charge	Q _g	V _{DS} =20V,V _{GS} =10V, I _D =50A		105		nC
Gate-Source Charge	Q _{gs}			32		
Gate-Drain Charge	Q _{gd}			20		
Turn-on delay time	t _{d(on)}	V _{DD} =20V,V _{GS} =10V, I _D =50A, R _G =2.5Ω		46		nS
Turn-on rise time	t _r			112		
Turn-off delay time	t _{d(off)}			129		
Turn-off fall time	t _f			51		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				330	A
Diode Forward voltage	V _{SD}	V _{GS} =0V,I _S =1A,T _J =25°C			1.2	V
Reverse Recovery Time	t _{rr}	I _S =50A ,di/dt =100A/μs,		81		nS
Reverse Recovery Charge	Q _{rr}	T _J =25°C		118		nC

Notes:

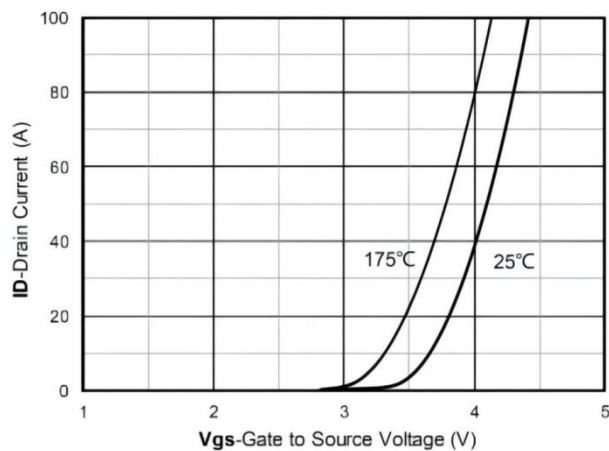
 1) The test condition is $V_{DD}=20\text{V}, V_{GS}=10\text{V}, L=0.5\text{mH}, R_G=25\Omega$

2) Guaranteed by design, not subject to production.

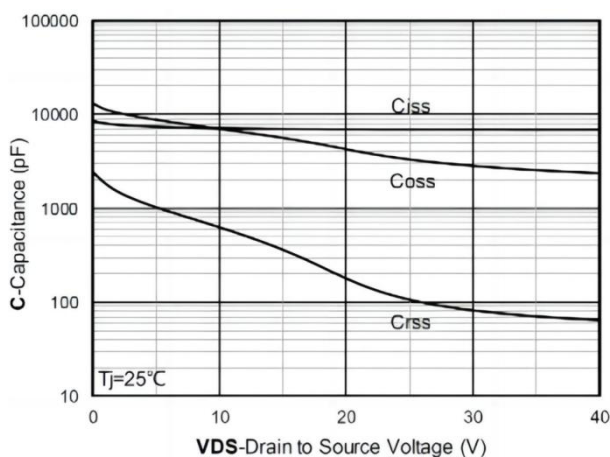
Typical Characteristics



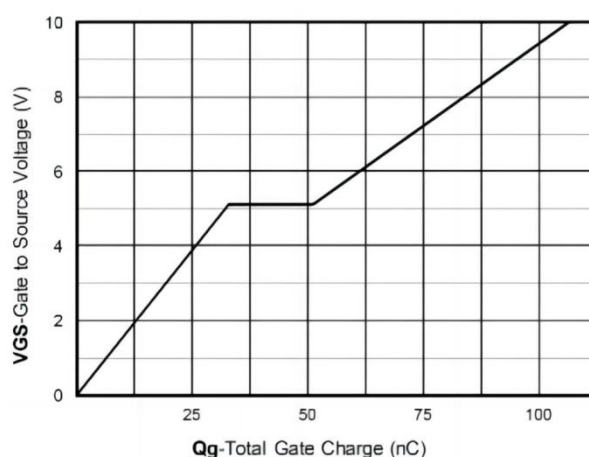
Output Characteristics



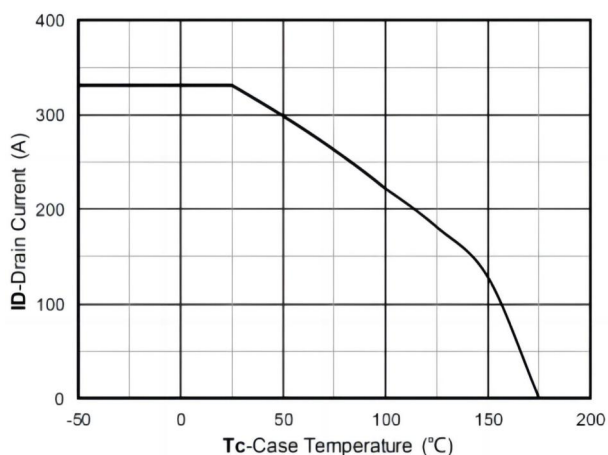
Transfer Characteristics



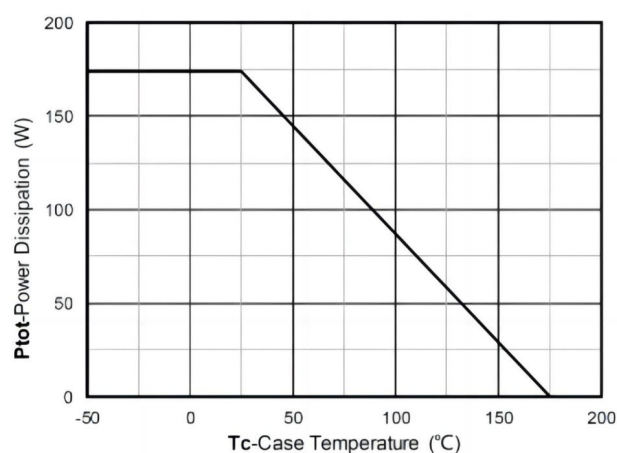
Capacitance Characteristics



Gate Charge

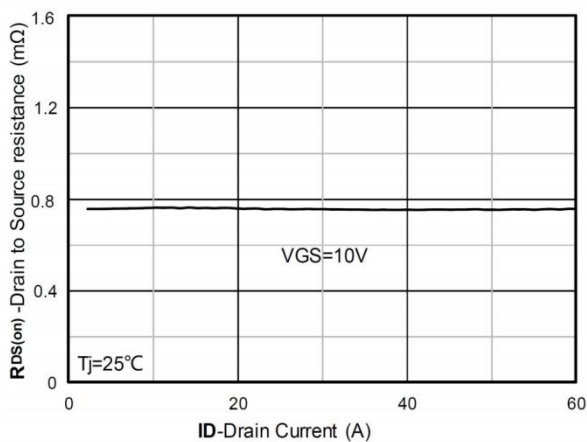


Current dissipation

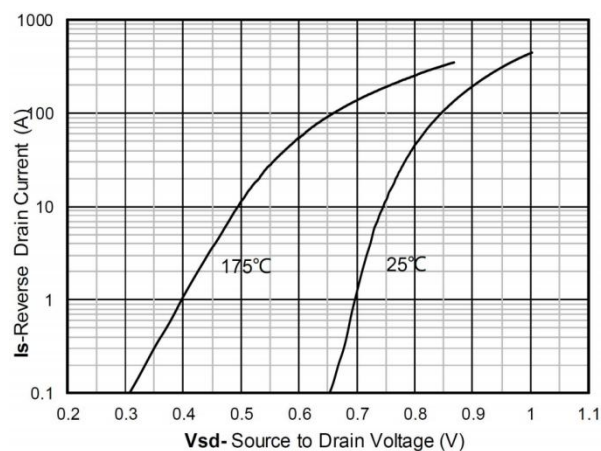


Power dissipation

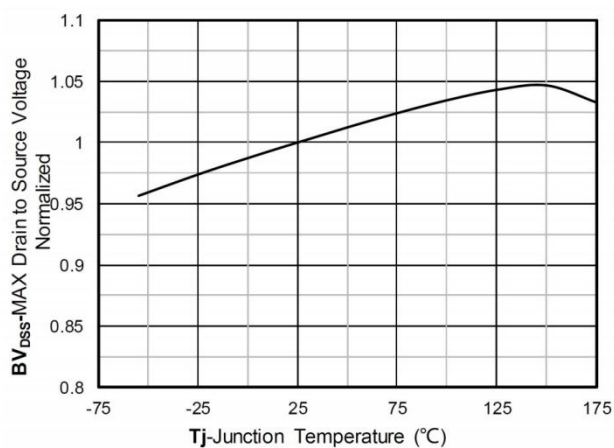
Typical Characteristics



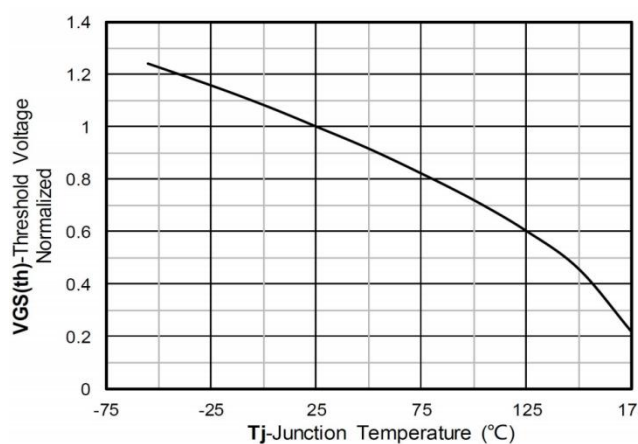
$R_{DS(on)}$ VS Drain Current



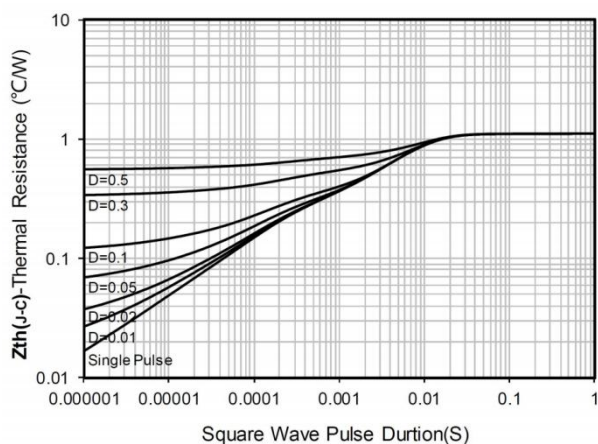
Forward characteristics of reverse diode



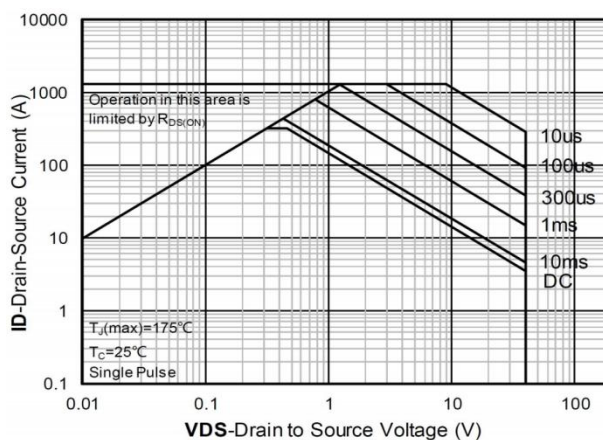
Normalized breakdown voltage



Normalized Threshold voltage

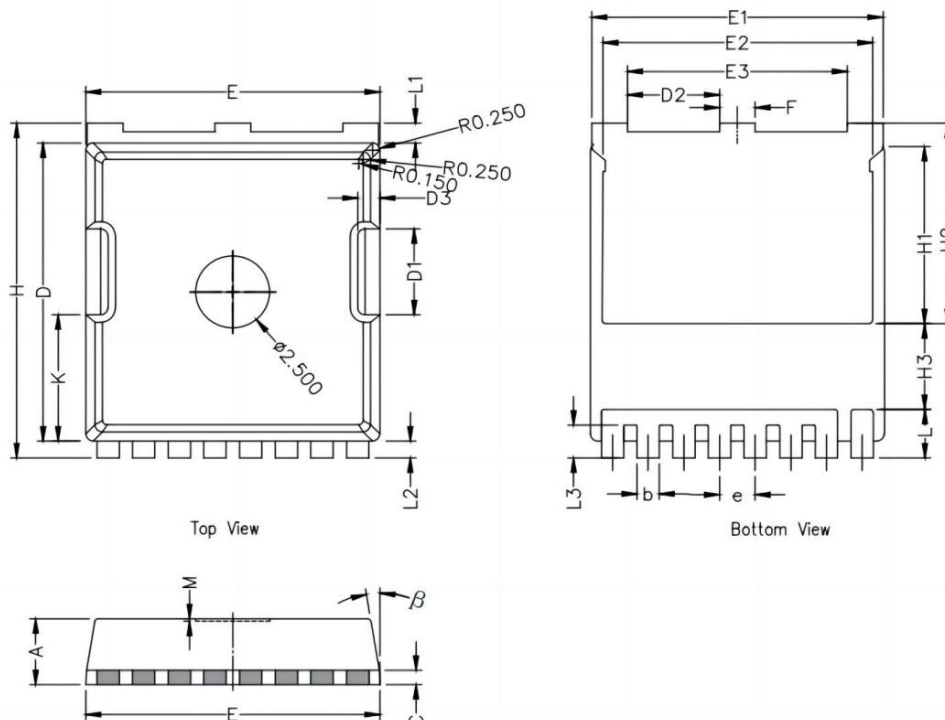


Maximum Transient Thermal Impedance



Safe Operation Area

TOLL Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
b	0.650	0.850	0.026	0.033
C	0.508 REF.		0.020 REF.	
D	10.250	10.550	0.404	0.415
D1	2.850	3.150	0.112	0.124
E	9.750	10.050	0.384	0.396
E1	9.650	9.950	0.380	0.392
E2	8.950	9.250	0.352	0.364
E3	7.250	7.550	0.285	0.297
e	1.200 BSC.		0.047 BSC.	
F	1.050	1.350	0.041	0.053
H	11.550	11.850	0.455	0.467
H1	6.030	6.330	0.237	0.249
H2	6.850	7.150	0.270	0.281
H3	3.000 BSC.		0.118 BSC.	
L	1.550	1.850	0.061	0.073
L1	0.550	0.850	0.022	0.033
L2	0.450	0.750	0.018	0.030
M	0.080 REF.		0.003 REF.	
β	8°	12°	8°	12°
K	4.250	4.550	0.167	0.179