

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	3.8mΩ@10V	105A
	5.5mΩ@4.5V	

Feature

- Fast switching
- Surface mount package
- Suffix "-Q1" for AEC-Q101

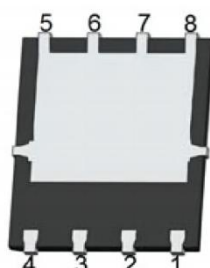
Application

- DC-DC converter
- Motor control

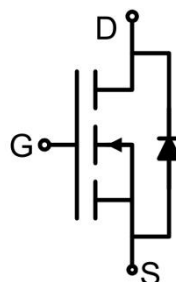
Package



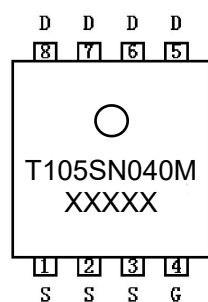
PDFN5*6-8L



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	105	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	70	A
Pulsed Drain Current	I_{DM}	420	A
Single Pulse Avalanche Energy ¹⁾	E_{AS}	462	mJ
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	83	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	1.5	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

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

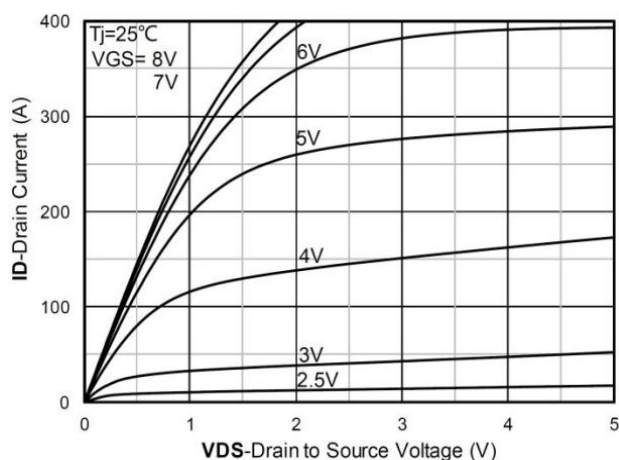
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =24V, V _{GS} =0V, T _J =25°C			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.5	2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		3	3.8	mΩ
		V _{GS} =4.5V, I _D =10A		4	5.5	
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f =1MHz		5595		pF
Output Capacitance	C _{oss}			421		
Reverse Transfer Capacitance	C _{rss}			380		
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =10V, I _D =30A		65		nC
Gate-Source Charge	Q _{gs}			11		
Gate-Drain Charge	Q _{gd}			16		
Turn-on delay time	t _{d(on)}	V _{DS} =20V, V _{GS} =10V, I _D =30A R _G =3Ω		12		nS
Turn-on rise time	t _r			16		
Turn-off delay time	t _{d(off)}			37		
Turn-off fall time	t _f			14		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				105	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =1A, T _J =25°C			1.2	V
Reverse recover time	T _{rr}	I _S =30A, di/dt =-100A/us		23		nS
Reverse recovery charge	Q _{rr}	T _J =25°C		10		nC

Notes:

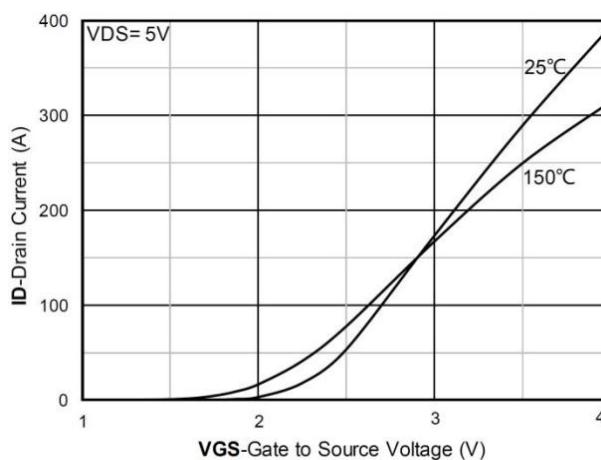
1) The EAS test condition is $V_{DD}=20V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$.

2) Guaranteed by design, not subject to production.

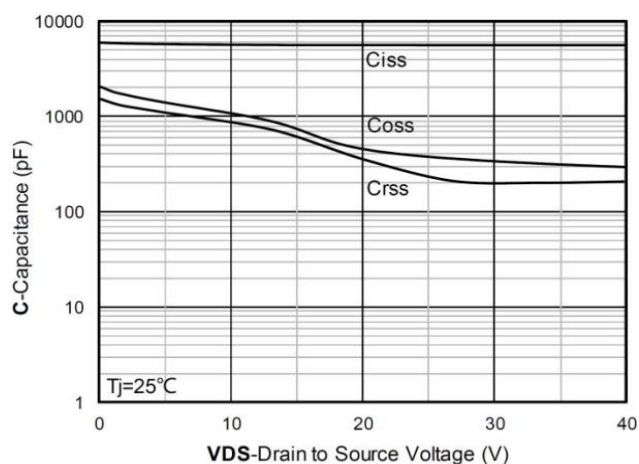
Typical Characteristics



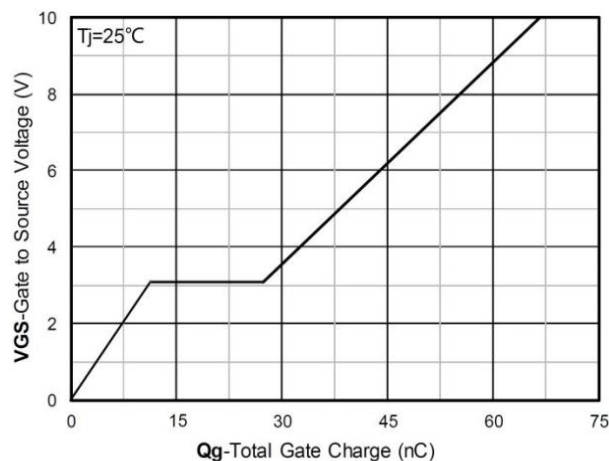
Output Characteristics



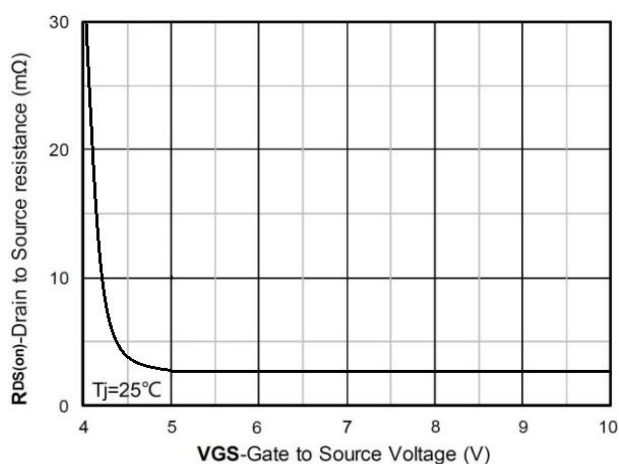
Transfer Characteristics



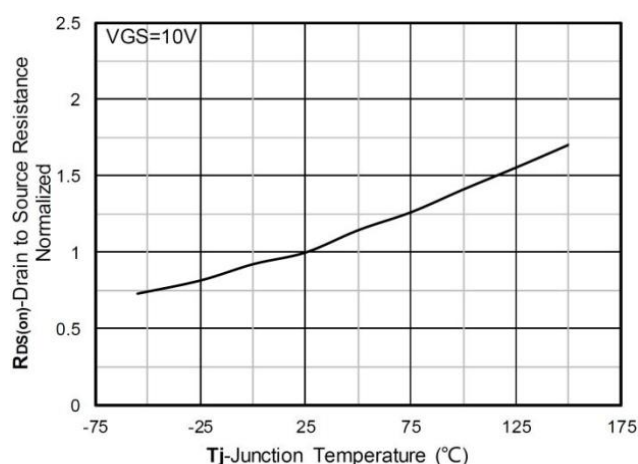
Capacitance Characteristics



Gate Charge

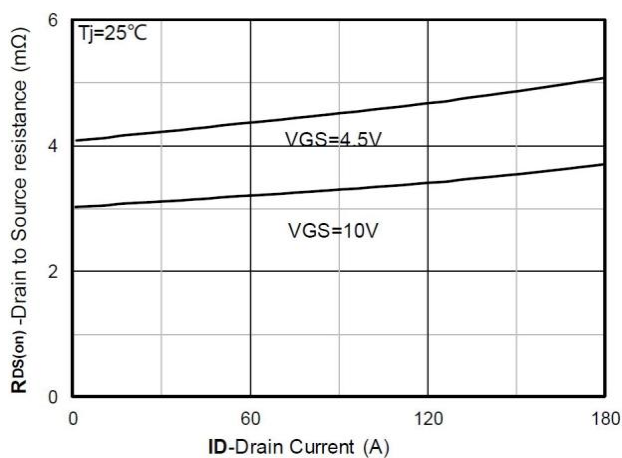


On-Resistance vs Gate to Source Voltage

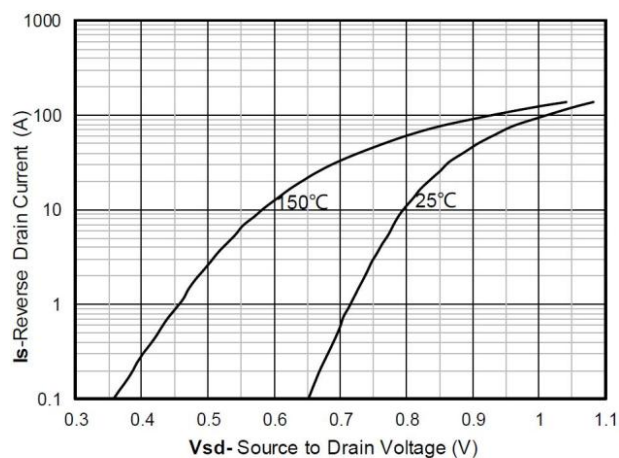


Normalized On-Resistance

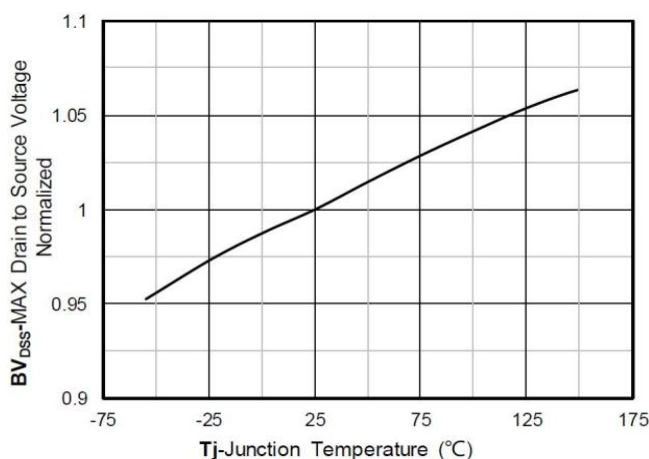
Typical Characteristics



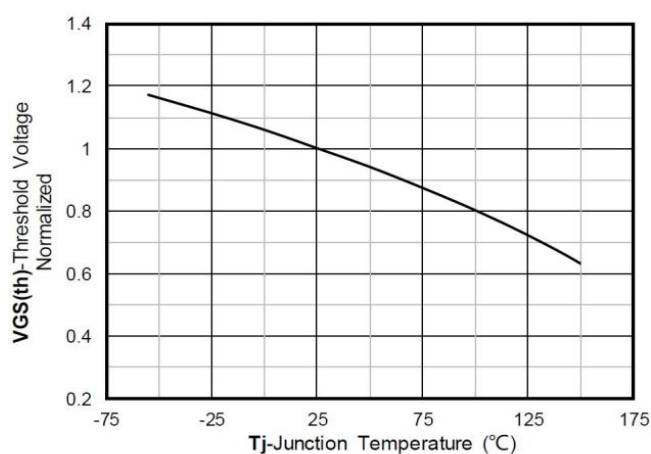
RDS(on) VS Drain Current



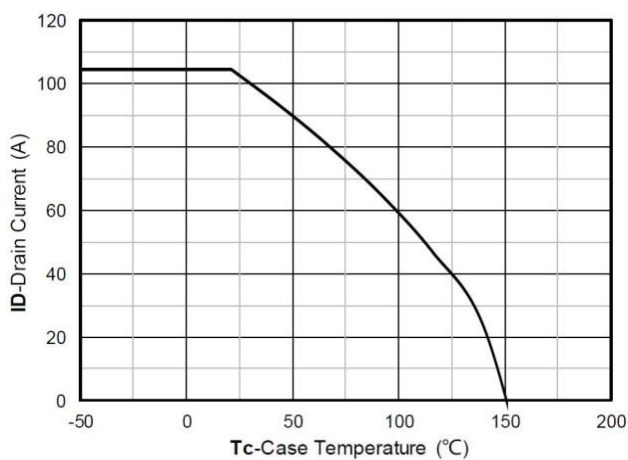
Forward characteristics of reverse diode



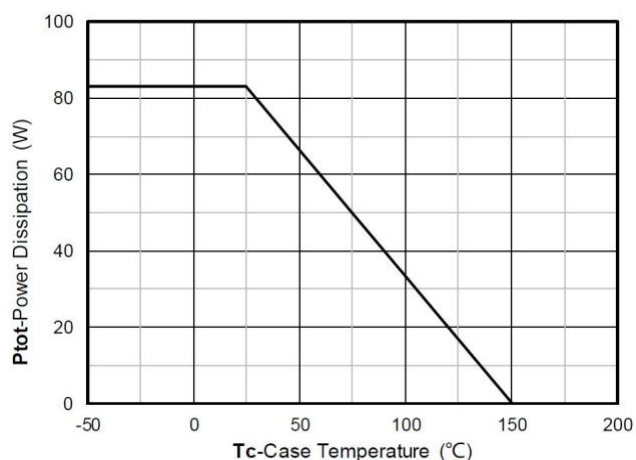
Normalized breakdown voltage



Normalized Threshold voltage

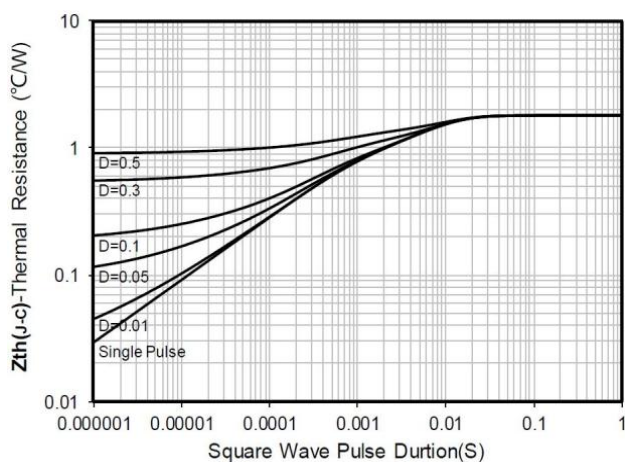


Current dissipation

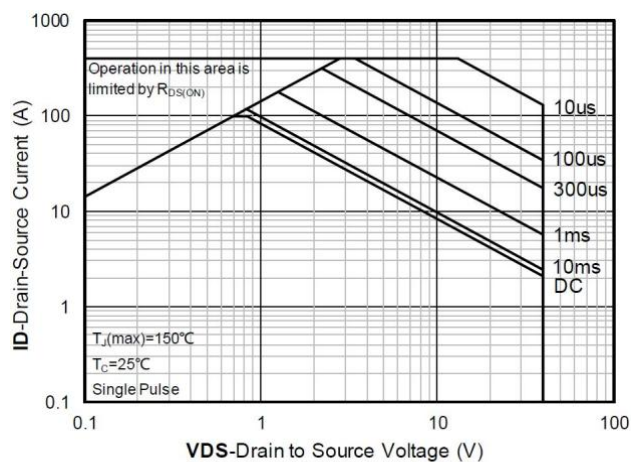


Power dissipation

Typical Characteristics

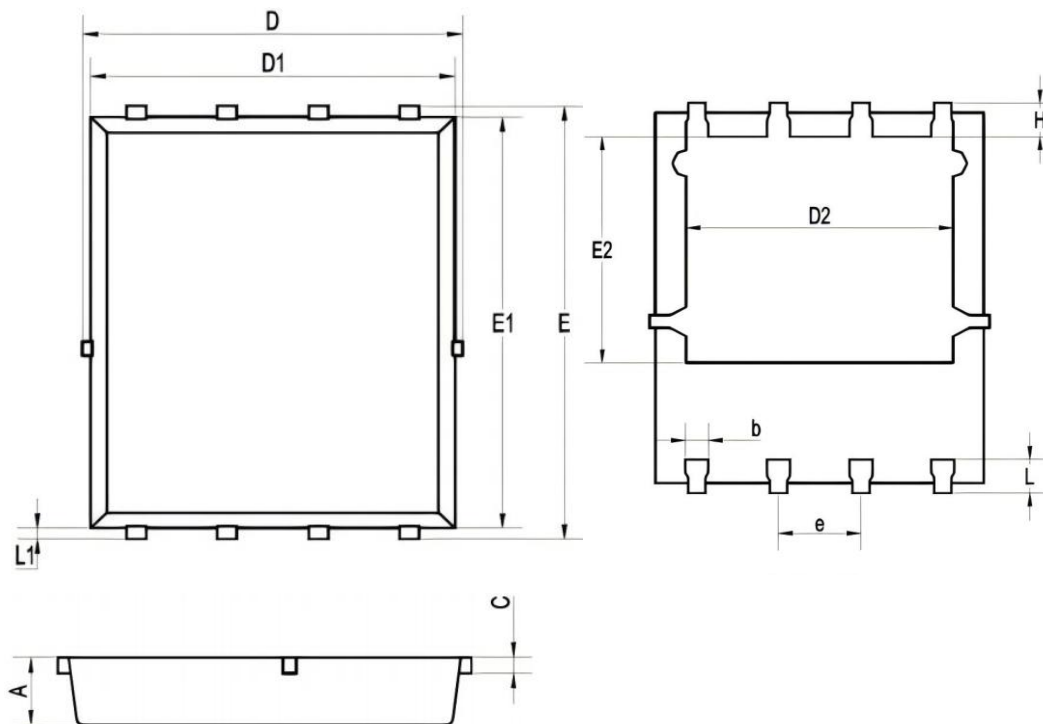


Maximum Transient Thermal Impedance



Safe Operation Area

PDFN5*6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.120	0.035	0.044
b	0.330	0.510	0.013	0.020
C	0.110	0.340	0.004	0.013
D	4.700	5.260	0.185	0.207
D1	4.700	5.100	0.185	0.201
D2	3.560	4.500	0.140	0.177
E	5.750	6.250	0.226	0.246
E1	5.600	6.000	0.220	0.236
E2	3.180	3.660	0.125	0.144
e	1.170	1.370	0.046	0.054
L	0.350	0.710	0.014	0.028
L1	0.060	0.200	0.002	0.008
H	0.350	0.710	0.014	0.028