

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	4.6mΩ@10V	74A
	7mΩ@4.5V	

Feature

- Advanced high cell density trench technology
- Low thermal resistance
- Suffix "-Q1" for AEC-Q101

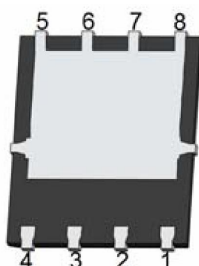
Application

- DC-DC converter
- Power management functions

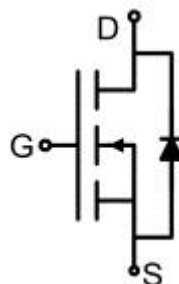
Package



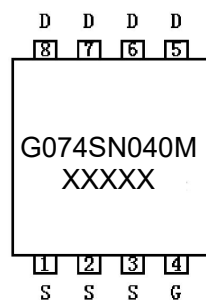
PDFN5*6-8L



Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹⁾ ($V_{GS}=10\text{V}$)	I_D	74	A
Continuous Drain Current ¹⁾ ($V_{GS}=10\text{V}$, $T_c=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	47	A
Pulsed Drain Current ^{1, 2, 3)} ($V_{GS}=10\text{V}$)	I_{DM}	390	A
Single Pulse Avalanche Energy ($V_{DD}=30\text{V}$, $L=1\text{mH}$)	E_{AS}	16	mJ
Power Dissipation	P_D	42	W
Thermal Resistance Junction to Case ¹⁾	$R_{\theta JC}$	3	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature Range	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} =32V, V _{GS} =0V			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	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} =10V, I _D =15A		4	4.6	mΩ
		V _{GS} =4.5V, I _D =10A		6.2	7	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f =1MHz		1045		pF
Output Capacitance	C _{oss}			371		
Reverse Transfer Capacitance	C _{rss}			40		
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =10V, I _D =15A		21.7		nC
Gate-Source Charge	Q _{gs}			3.2		
Gate-Drain Charge	Q _{gd}			5.3		
Turn-on delay time	t _{d(on)}	V _{DS} =20V, V _{GS} =10V I _D =15A, R _G =3.9Ω R _L =1.33Ω		5.7		nS
Turn-on rise time	t _r			24		
Turn-off delay time	t _{d(off)}			24		
Turn-off fall time	t _f			18		
Source-Drain Diode characteristics						
Diode Forward Current	I _S	T _C =25°C			74	A
Diode Forward voltage ²⁾	V _{SD}	V _{GS} =0V, I _S =15A			1.3	V
Reverse Recovery Time	T _{rr}	V _{GS} =0V, I _S =15A di/dt =-100A/μs		43		nS
Reverse Recovery Charge	Q _{rr}			32		nC

Notes:

 1) Surface mounted on 1 in2 pad area, $t \leq 10$ sec.

 2) The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

3) Limited by bonding wire.

4) Guaranteed by design, not subject to production.

Typical Characteristics

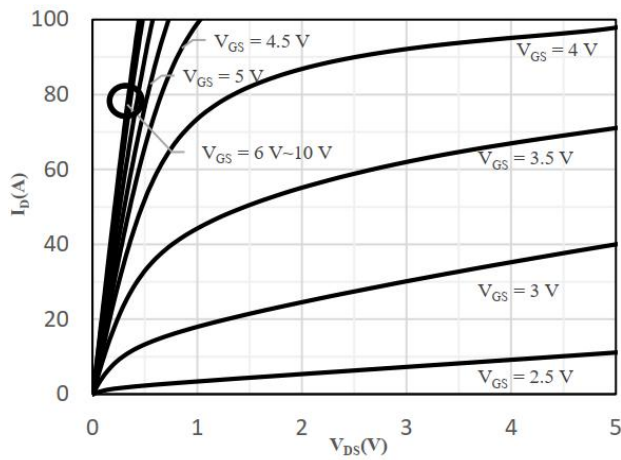


Fig 1 Typical Output Characteristics

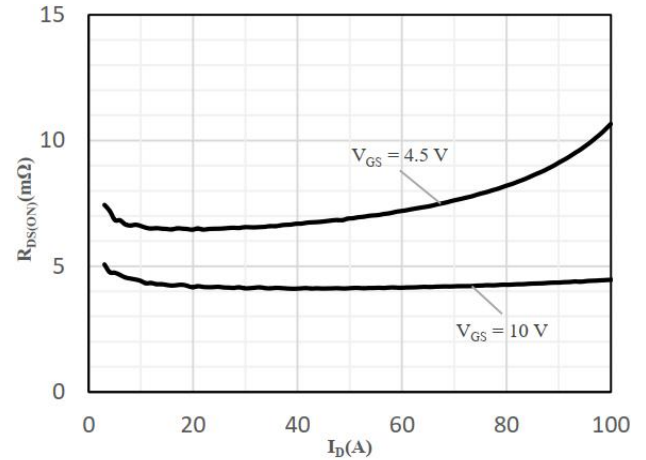


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

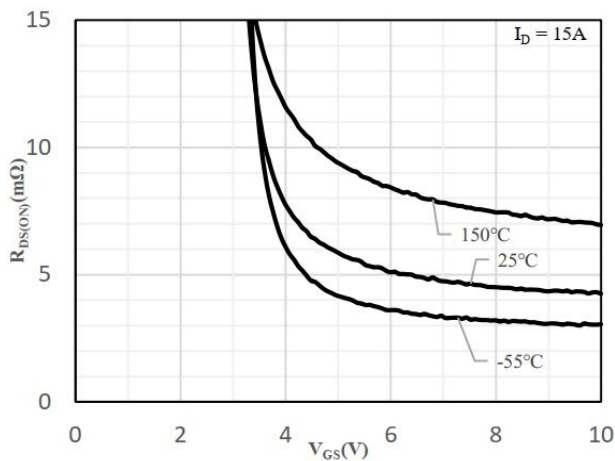


Fig 3 On-Resistance vs. Gate-Source Voltage

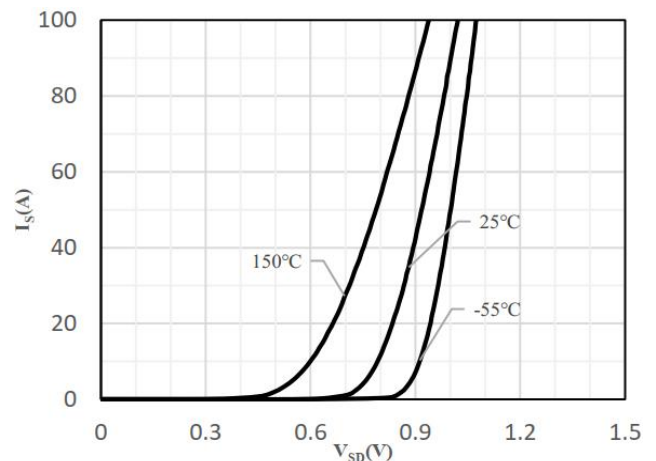


Fig 4 Body-Diode Characteristics

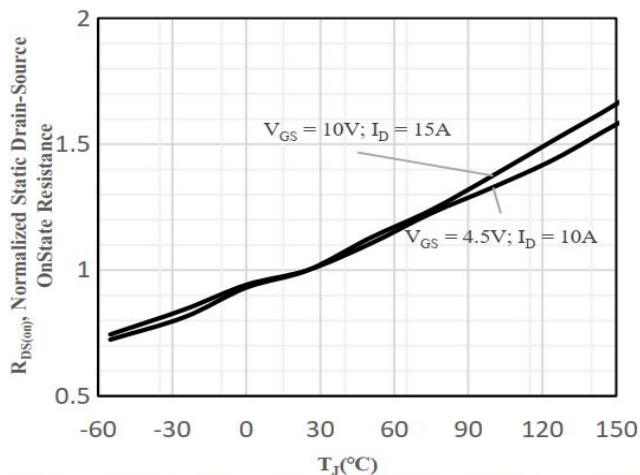


Fig 5 On-Resistance vs. Junction Temperature

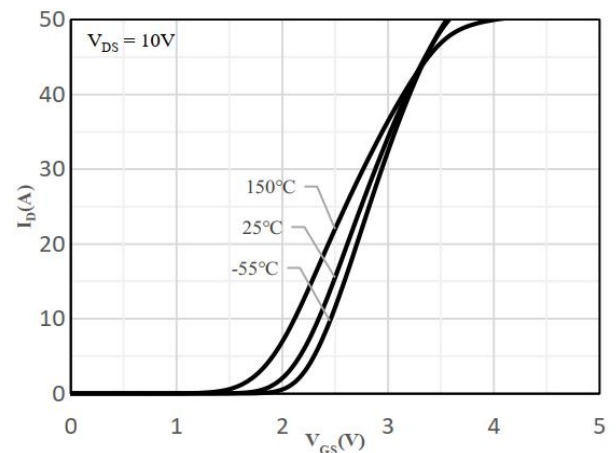


Fig 6 Transfer Characteristics

Typical Characteristics

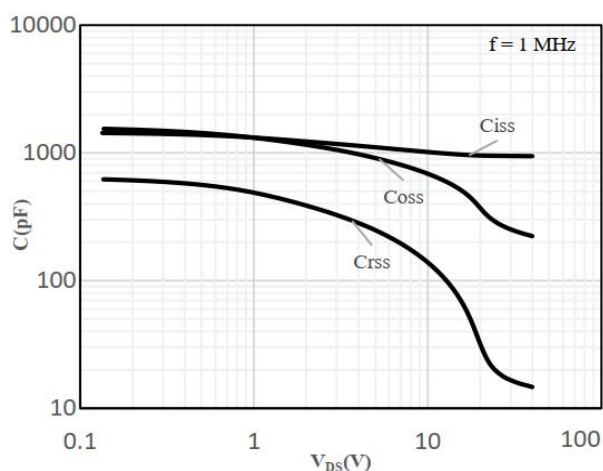


Fig 7 Capacitance Characteristics

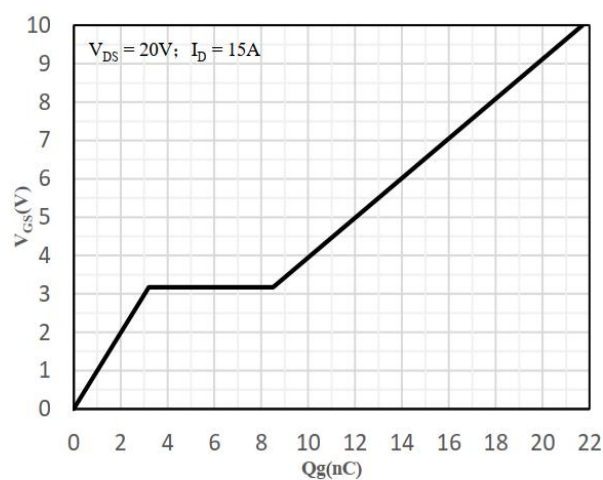


Fig 8 Gate-Charge Characteristics

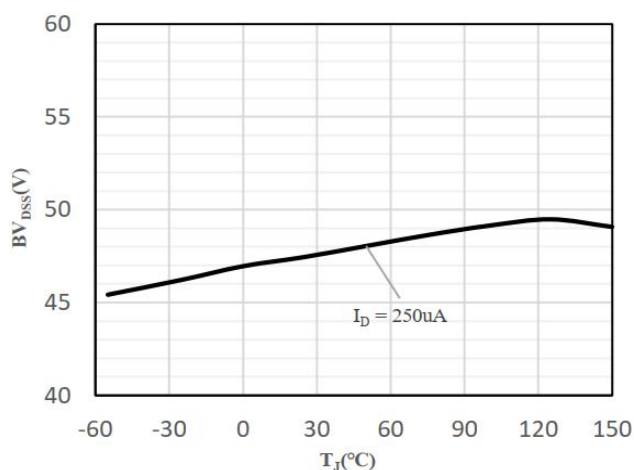


Fig 9 Breakdown Voltage vs. Junction Temperature

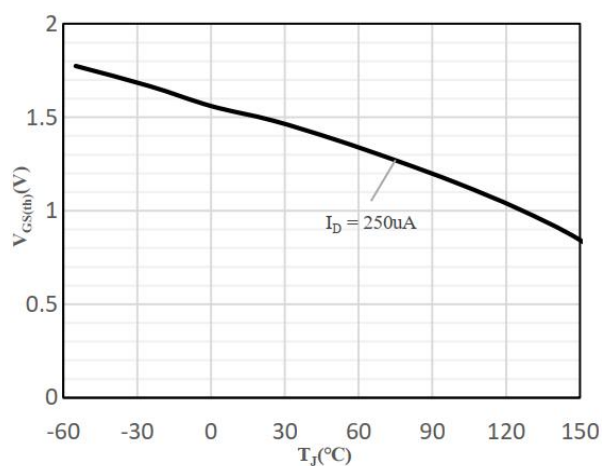
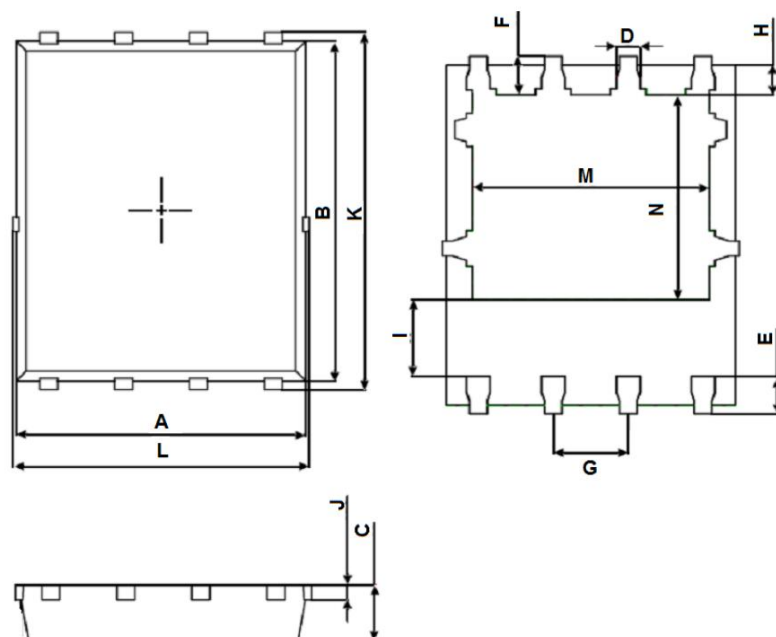


Fig 10 $V_{GS(th)}$ vs. Junction Temperature

PDFN5*6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.824	4.976	0.190	0.196
B	5.674	5.826	0.223	0.229
C	0.900	1.000	0.035	0.039
D	0.350	0.450	0.014	0.018
E	0.559	0.711	0.022	0.028
F	0.574	0.726	0.023	0.029
G	1.250	1.290	0.049	0.051
H	0.424	0.576	0.017	0.023
I	1.190	1.390	0.047	0.055
J	0.154	0.354	0.006	0.014
K	5.974	6.126	0.235	0.241
L	4.944	5.096	0.195	0.201
M	3.910	4.110	0.154	0.162
N	3.375	3.575	0.133	0.141