

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	25mΩ@10V	24A
	30mΩ@4.5V	

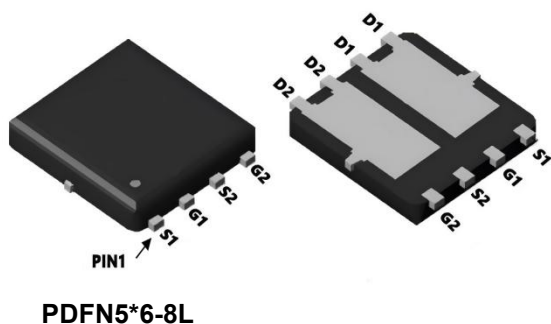
Feature

- Lower $R_{DS(on)}$
- Good stability and uniformity
- Suffix "-Q1" for AEC-Q101

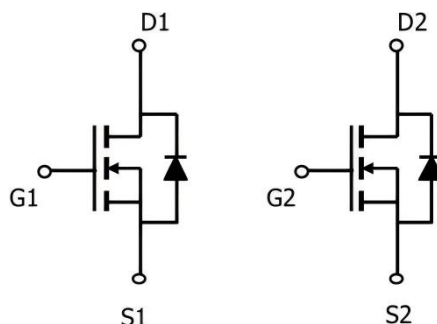
Application

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

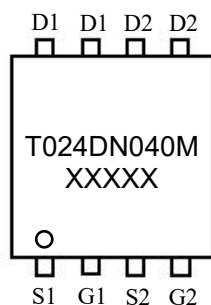
Package



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	I_D	24	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	15	A
Pulsed Drain Current ($t_p=10\mu\text{s}$)	I_{DM}	96	A
Single Pulse Avalanche Energy ²⁾	E_{AS}	18	mJ
Power Dissipation	P_D	28	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	4.5	$^{\circ}\text{C/W}$
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} =40V, 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	1.4	2.5	V
Drain-source on-resistance ¹⁾	R _{DS(on)}	V _{GS} =10V, I _D =8A		18	25	mΩ
		V _{GS} =4.5V, I _D =5A		23	30	
Dynamic characteristics ³⁾						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f =1MHz		732		pF
Output Capacitance	C _{oss}			59		
Reverse Transfer Capacitance	C _{rss}			46		
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =10V, I _D =5A		16.7		nC
Gate-Source Charge	Q _{gs}			2.6		
Gate-Drain Charge	Q _{gd}			2.5		
Turn-on delay time	t _{d(on)}	V _{DS} =20V, V _{GS} =10V, I _D =8A R _L =1Ω, R _G =3Ω		10		nS
Turn-on rise time	t _r			12		
Turn-off delay time	t _{d(off)}			32		
Turn-off fall time	t _f			8		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				24	A
Diode Forward voltage ¹⁾	V _{SD}	V _{GS} =0V, I _S =8A			1.2	V
Reverse Recovery Time	T _{rr}	V _{GS} =0V, I _F =8A		17		nS
Reverse Recovery Charge	Q _{rr}	di/dt =100A/μs		6.2		nC

Notes:

- 1) The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- 2) The E_{AS} data shows Max. rating. The test condition is $V_{DD}=20\text{V}, V_{GS}=10\text{V}, L=1\text{mH}$.
- 3) Guaranteed by design, not subject to production.

Typical Characteristics

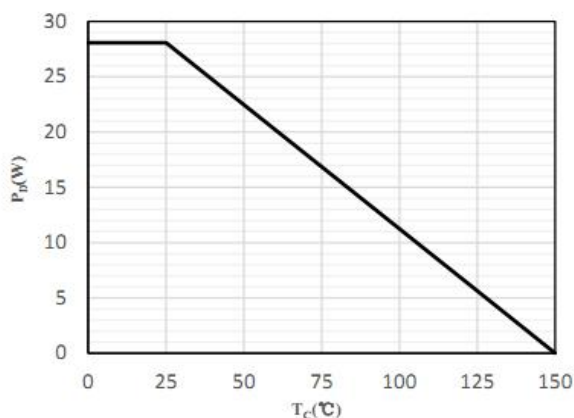


Fig 1 Power Dissipation

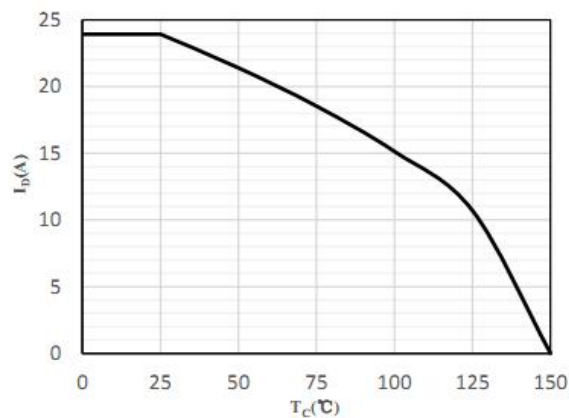


Fig 2 Drain Current

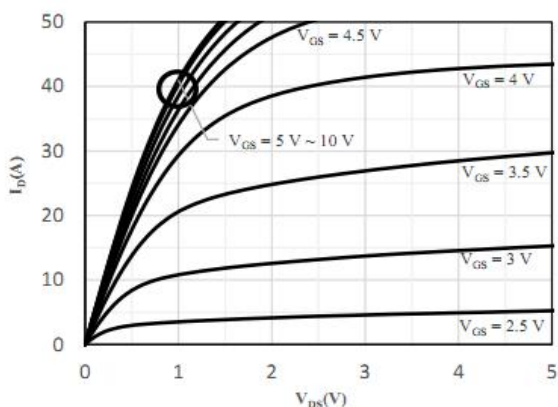


Fig 3 Typical Output Characteristics

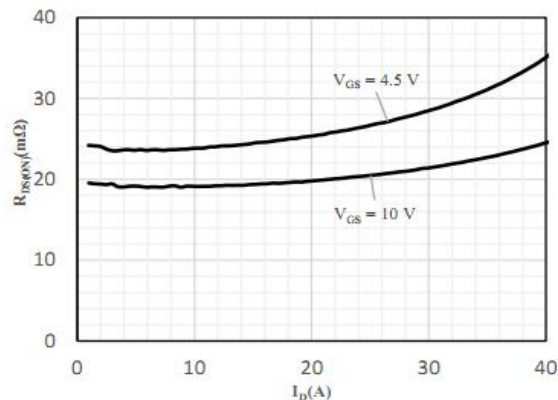


Fig 4 On-Resistance vs. Drain Current
and Gate Voltage

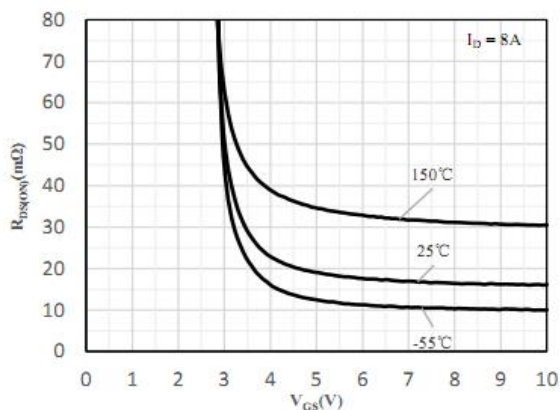


Fig 5 On-Resistance vs. Gate-Source Voltage

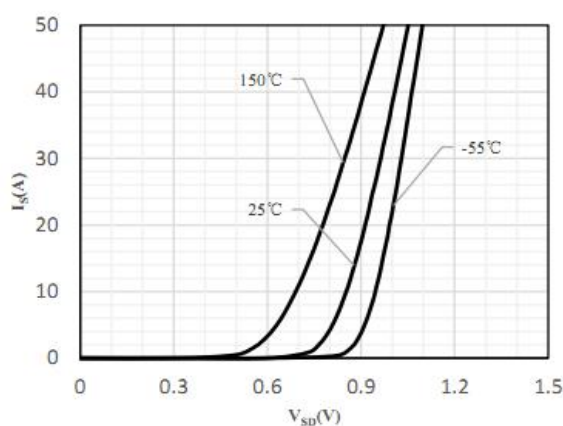


Fig 6 Body-Diode Characteristics

Typical Characteristics

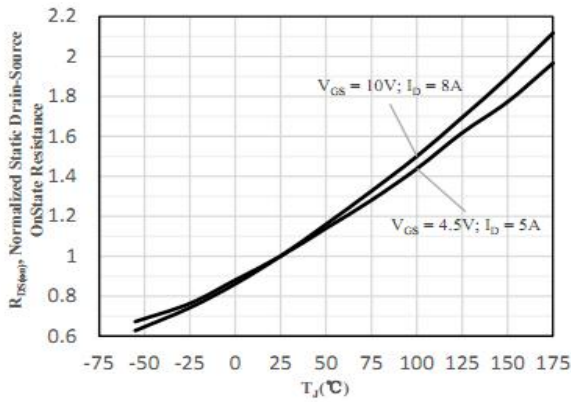


Fig 7 Normalized On-Resistance vs. Junction Temperature

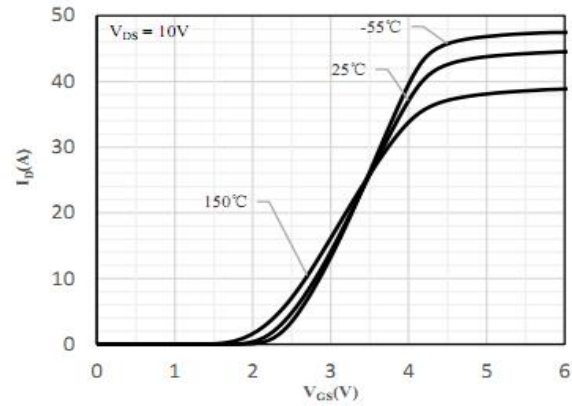


Fig 8 Transfer Characteristics

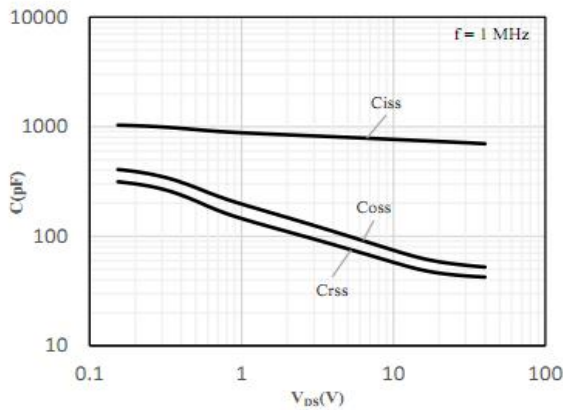


Fig 9 Capacitance Characteristics

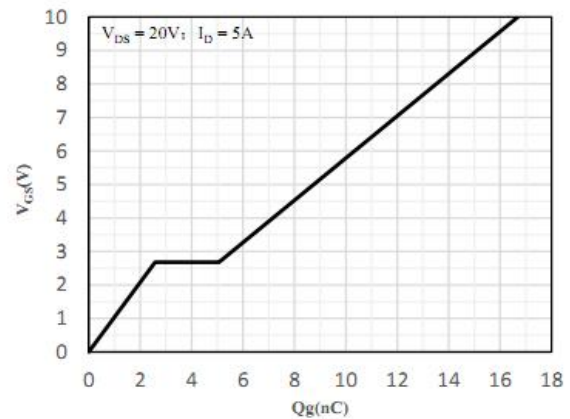


Fig 10 Gate-Charge Characteristics

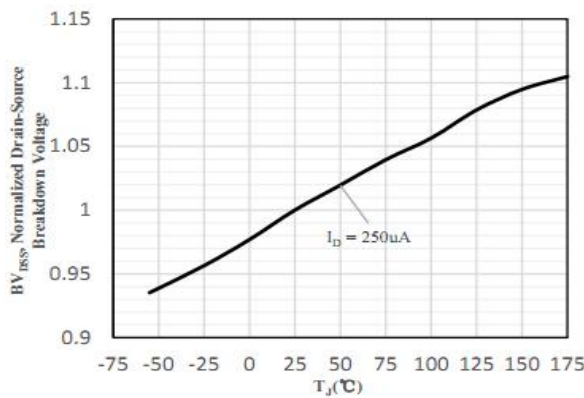


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

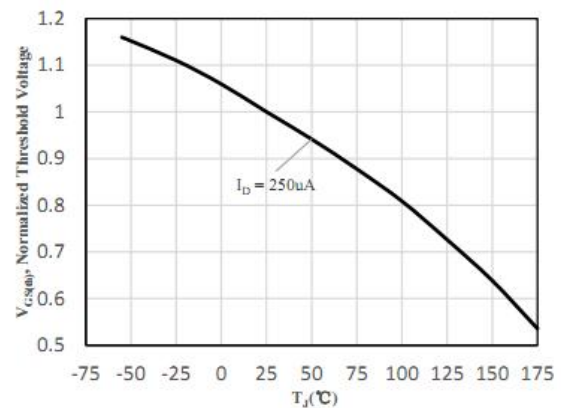


Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature

Typical Characteristics

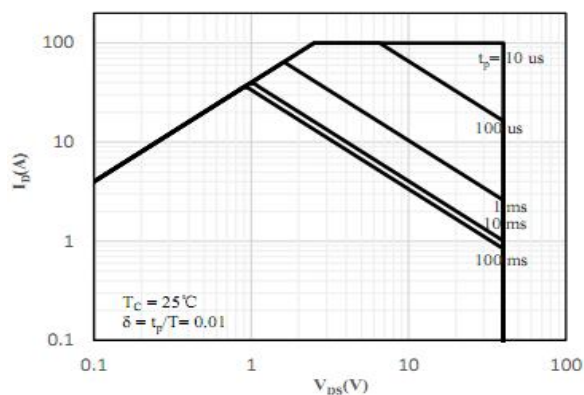


Fig 13 Safe Operation Area

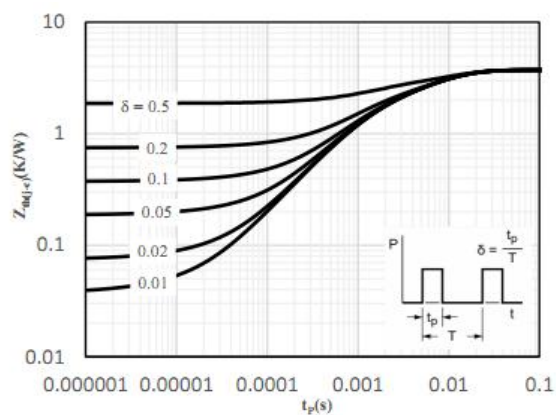
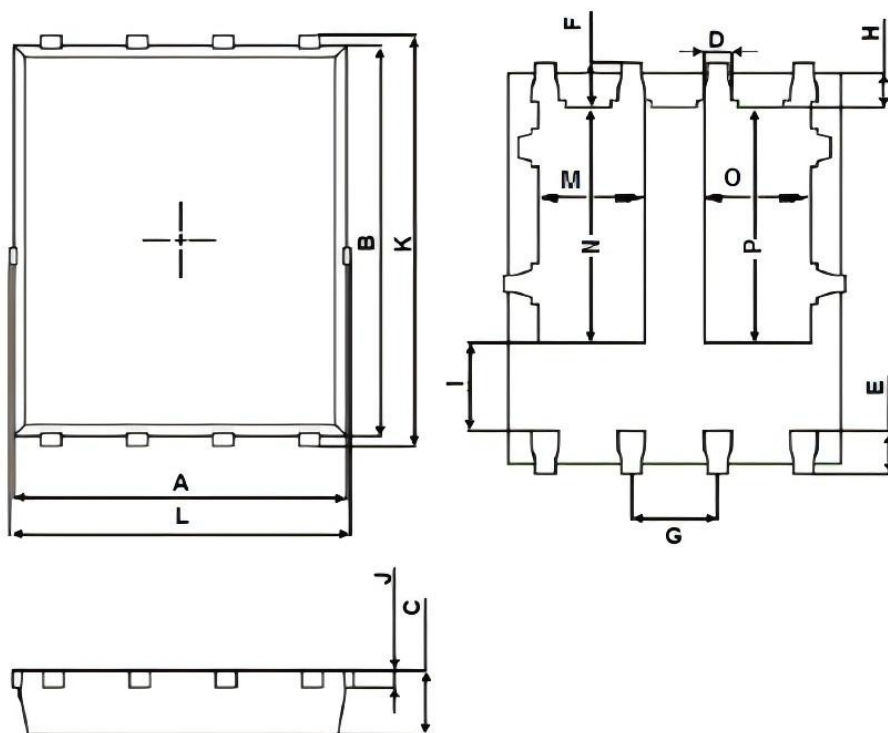


Fig 14 Maximum transient thermal impedance

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/O	1.595	1.795	0.063	0.071
N/P	3.375	3.575	0.133	0.141