

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-60V	50mΩ@-10V	-25A
	65mΩ@-4.5V	

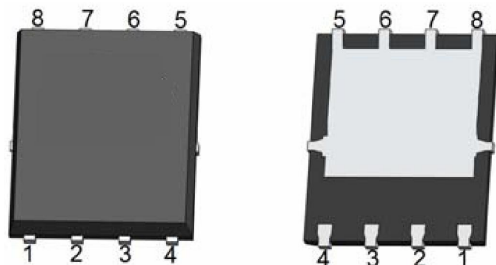
Feature

- Split gate trench MOSFET technology
- Low $R_{DS(on)}$ & FOM
- Low C_{rss}
- Extremely low switching loss
- Excellent stability and uniformity
- Suffix "-Q1" for AEC-Q101

Application

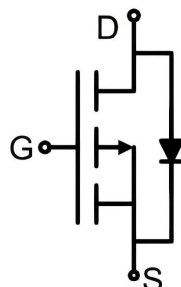
- Automotive Systems
- Industrial DC/DC Conversion Circuits

Package

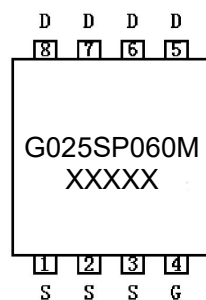


PDFN5*6-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	-25	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D (100^{\circ}\text{C})$	-16	A
Pulsed Drain Current ¹⁾	I_{DM}	-75	A
Single Pulse Avalanche Energy ²⁾	E_{AS}	81	mJ
Power Dissipation ³⁾ ($T_C=25^{\circ}\text{C}$)	P_D	60	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	2.1	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

Electrical characteristics ($T_J=25^{\circ}\text{C}$, 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	-60			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-60V, 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	-1.3	-1.8	-2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-20A		38	50	mΩ
		V _{GS} =-4.5V, I _D =-10A		48	65	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =-30V, V _{GS} =0V, f =1MHz		1100		pF
Output Capacitance	C _{oss}			350		
Reverse Transfer Capacitance	C _{rss}			28		
Total Gate Charge	Q _g	V _{DS} =-30V, V _{GS} =-10V I _D =-20A		18.7		nC
Gate-Source Charge	Q _{gs}			4.7		
Gate-Drain Charge	Q _{gd}			3		
Turn-on delay time	t _{d(on)}	V _{DS} =-30V, V _{GS} =-10V R _L =2.5Ω, R _G =6Ω		7.5		nS
Turn-on rise time	t _r			39.5		
Turn-off delay time	t _{d(off)}			43.6		
Turn-off fall time	t _f			55.1		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				-25	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =-20A			-1.3	V
Reverse Recovery Time	T _{rr}	I _F =-20A, di/dt =100A/μs		20.2		nS
Reverse Recovery Charge	Q _{rr}			8.2		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) $V_{DD}=50\text{V}, R_G=25\Omega, L=0.5\text{mH}, I_{AS}=18\text{A}$.
- 3) P_d is based on max. junction temperature, using junction-case thermal resistance.
- 4) Guaranteed by design, not subject to production.

Typical Characteristics

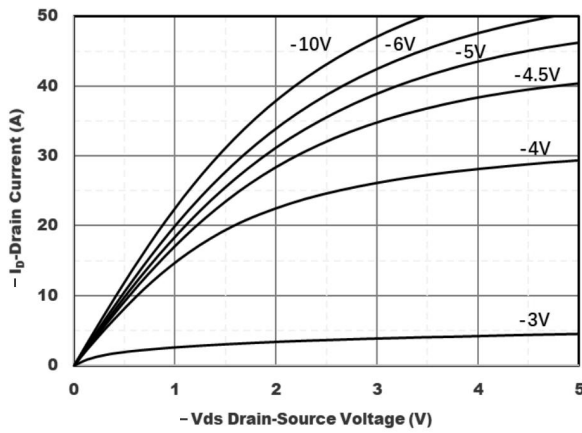


Figure1. Output Characteristics

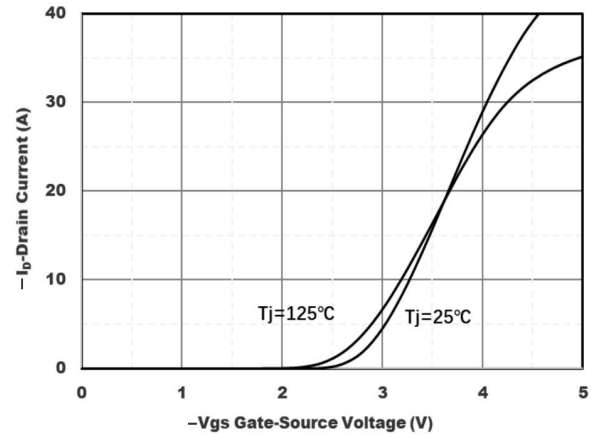


Figure2. Transfer Characteristics

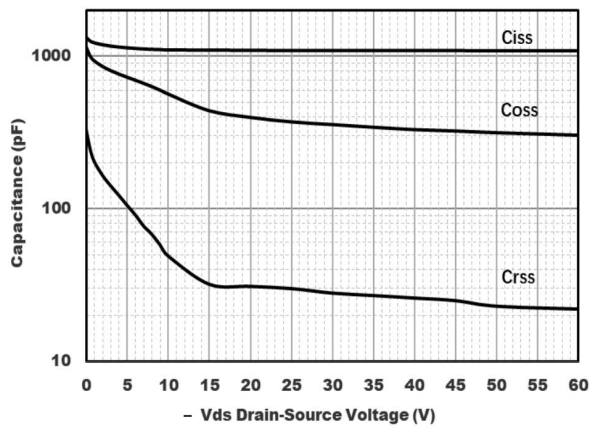


Figure3. Capacitance Characteristics

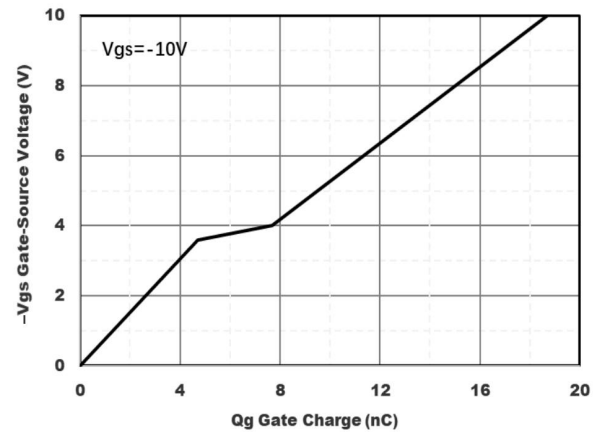


Figure4. Gate Charge

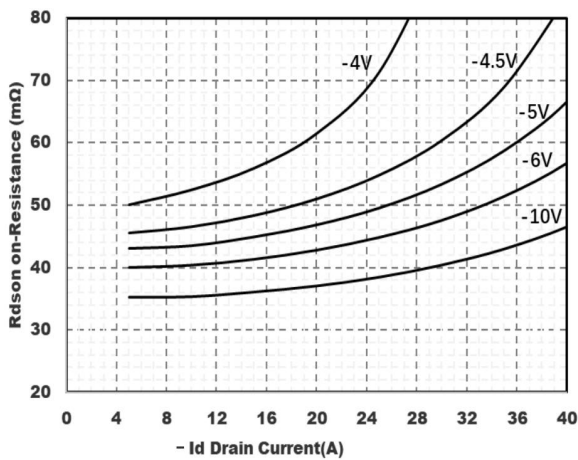


Figure5. : On-Resistance vs. Gate to Source Voltage

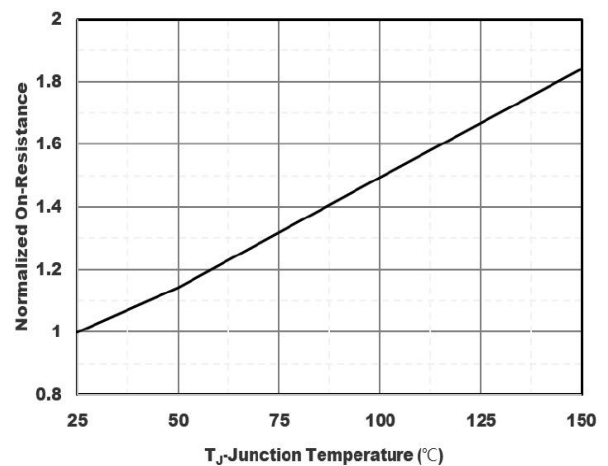


Figure6. Normalized On-Resistance

Typical Characteristics

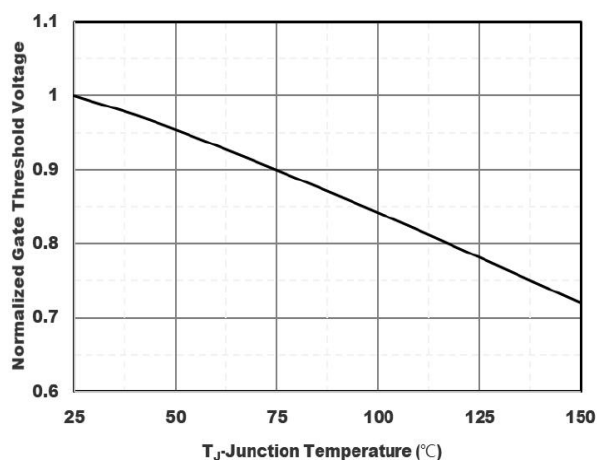


Figure7. Normalized Gate Threshold Voltage

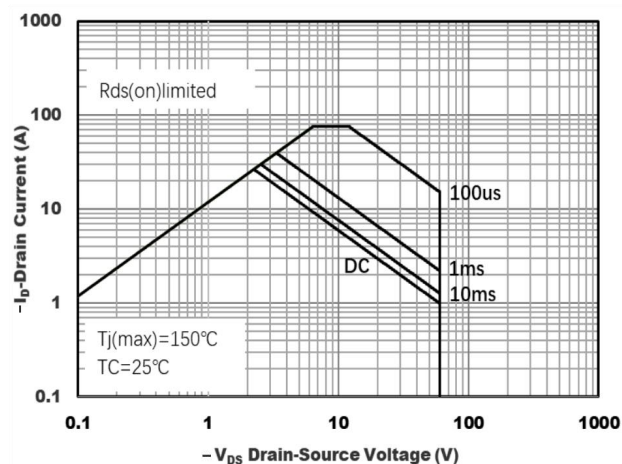


Figure8.Safe Operation Area

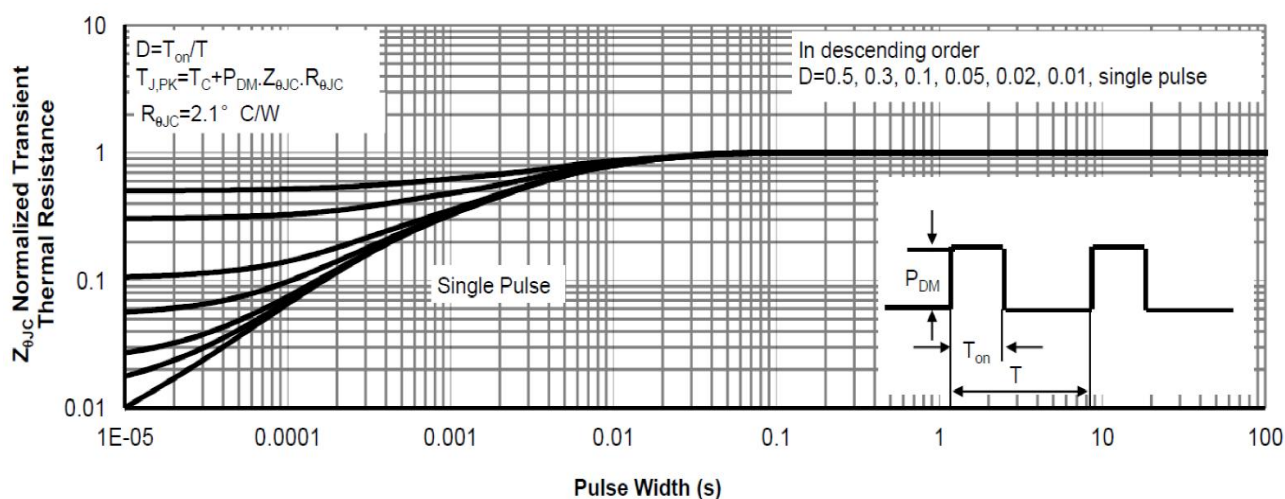
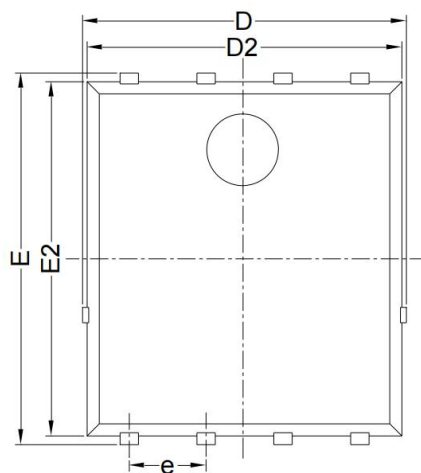
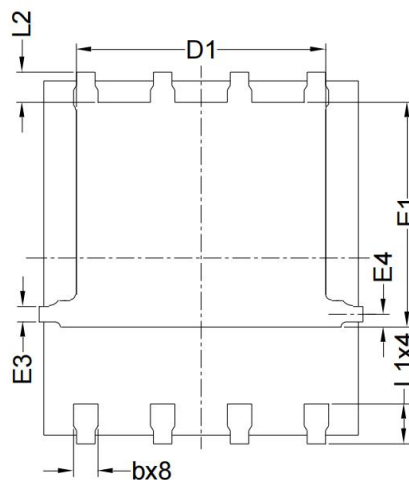


Figure9.Normalized Maximum Transient thermal impedance

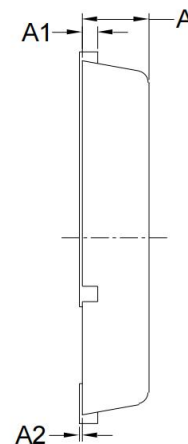
PDFN5*6-8L Package Information



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
D	5.150	5.550	0.203	0.219
E	5.950	6.350	0.234	0.250
A	1.000	1.200	0.039	0.047
A1	0.254 BSC.		0.010 BSC.	
A2	0.000	0.100	0.000	0.004
D1	3.920	4.320	0.154	0.170
E1	3.520	3.920	0.139	0.154
D2	5.000	5.400	0.197	0.213
E2	5.660	6.060	0.223	0.239
E3	0.254 REF.		0.010 REF.	
E4	0.210 REF.		0.008 REF.	
L1	0.560	0.760	0.022	0.030
L2	0.500 BSC.		0.020 BSC.	
b	0.310	0.510	0.012	0.020
e	1.270 BSC.		0.050 BSC.	