

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	3.7mΩ@10V	85A
	5mΩ@4.5V	

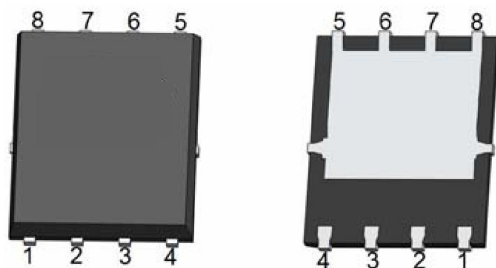
Feature

- Split gate trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Suffix "-Q1" for AEC-Q101

Application

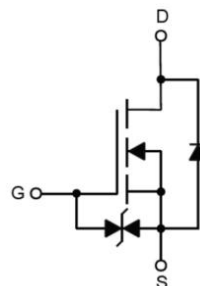
- DC-DC convertor
- Power management functions
- Synchronous-rectification application

Package

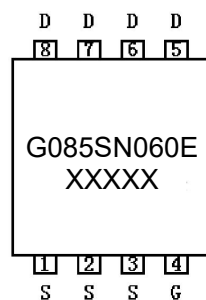


PDFN5*6-8L

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 ¹⁾ ($T_C = 25^{\circ}\text{C}$)	I_D	85	A
Continuous Drain Current ¹⁾ ($T_C = 100^{\circ}\text{C}$)	$I_D (100^{\circ}\text{C})$	54	A
Pulsed Drain Current	I_{DM}	340	A
Single Pulse Avalanche Energy ²⁾	E_{AS}	400	mJ
Power Dissipation ³⁾ ($T_C = 25^{\circ}\text{C}$)	P_D	110	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	1.1	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

Electrical characteristics ($T_J=25^{\circ}\text{C}$, 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			±10	μA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.6	2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		2.9	3.7	mΩ
		V _{GS} =4.5V, I _D =20A		3.8	5	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f =1MHz		4650		pF
Output Capacitance	C _{oss}			850		
Reverse Transfer Capacitance	C _{rss}			65		
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =10V, I _D =25A		70.78		nC
Gate-Source Charge	Q _{gs}			16.64		
Gate-Drain Charge	Q _{gd}			10.62		
Turn-on delay time	t _{d(on)}	V _{DS} =30V, V _{GS} =10V, I _D =25A R _G =2Ω		15.9		nS
Turn-on rise time	t _r			55.2		
Turn-off delay time	t _{d(off)}			57.5		
Turn-off fall time	t _f			91.3		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				85	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 =500A/μs		41.6		nS
Reverse Recovery Charge	Q _{rr}			39.8		nC

Notes:

- 1) Repetitive rating; pulse width limited by max. junction temperature.
- 2) $V_{DD}=50V, V_G=10V, L=2mH, I_{AS}=20A$.
- 3) P_d is based on max. junction temperature, using junction-case thermal resistance.
- 4) Guaranteed by design, not subject to production.

Typical Characteristics

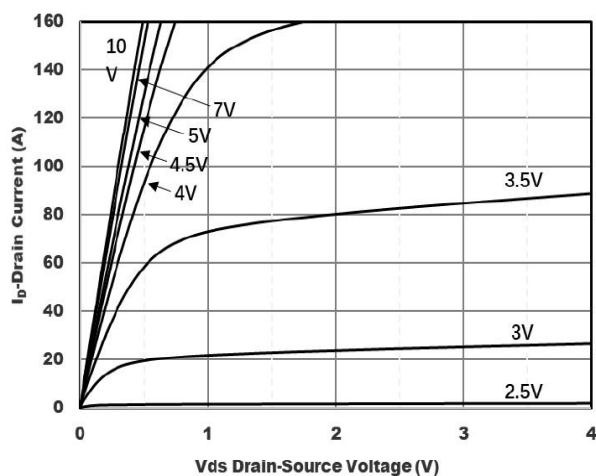


Figure1. Output Characteristics

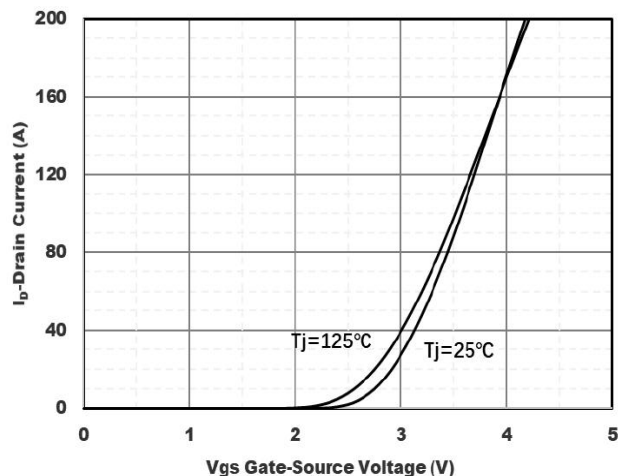


Figure2. Transfer Characteristics

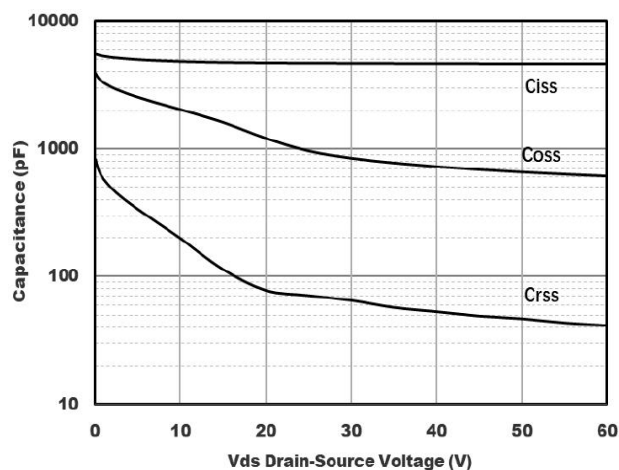


Figure3. Capacitance Characteristics

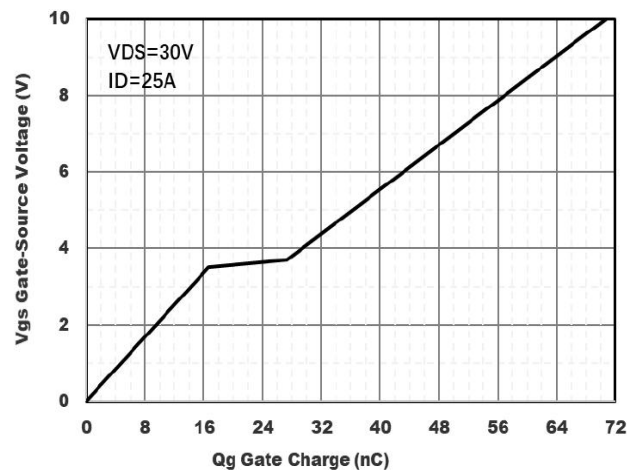


Figure4. Gate Charge

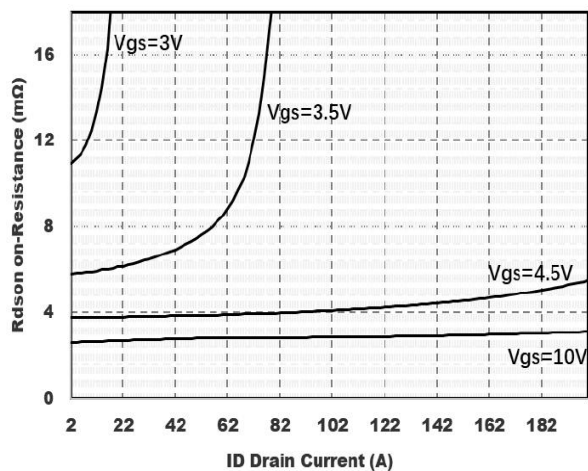


Figure5. Drain-Source on Resistance

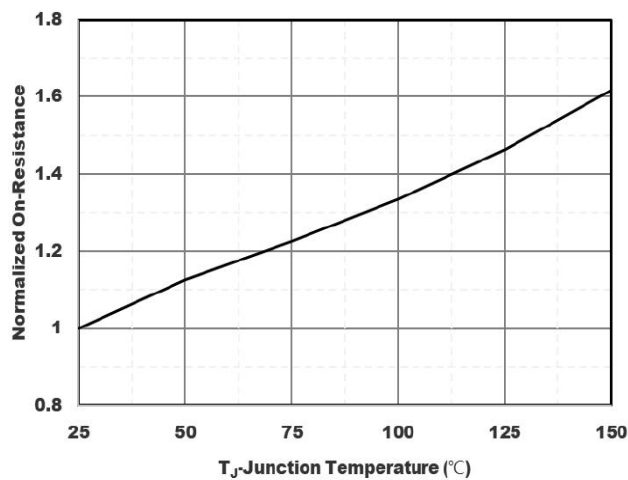


Figure6. Drain-Source on Resistance

Typical Characteristics

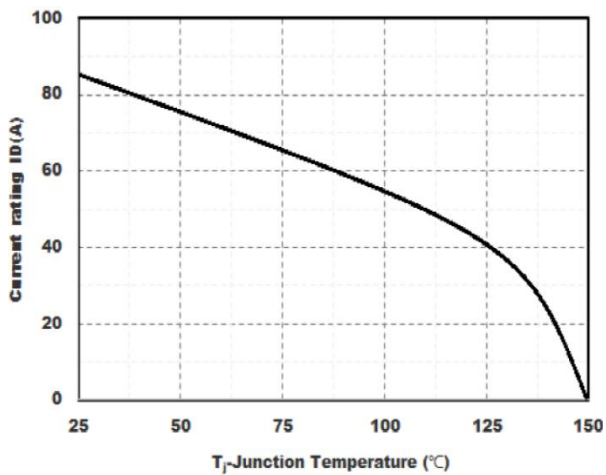


Figure7. Drain current

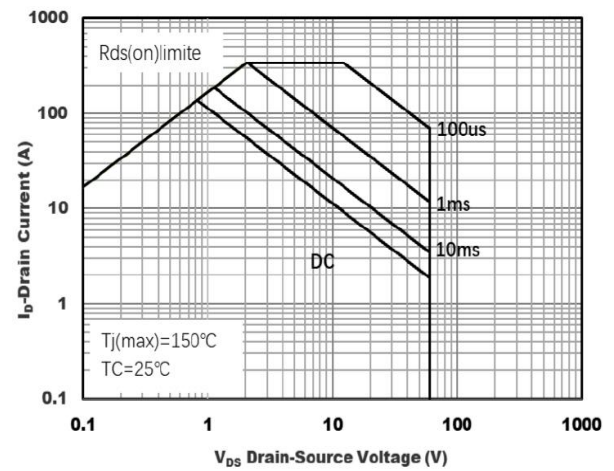


Figure8. Safe Operation Area

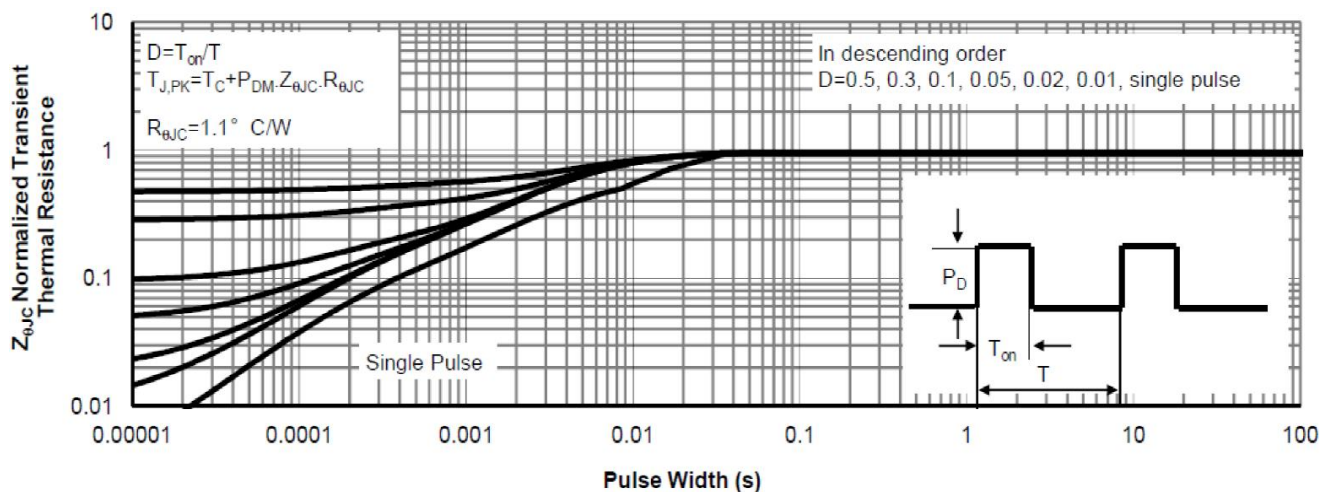
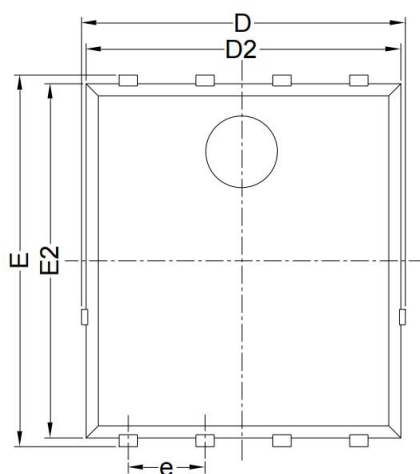
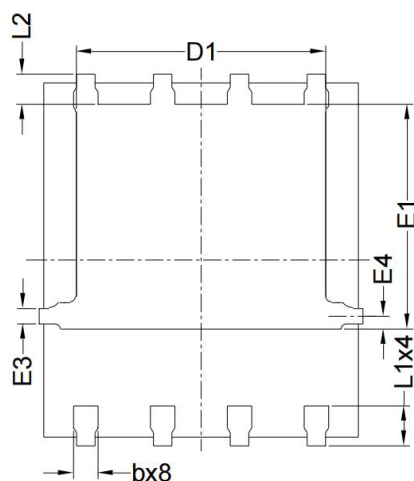


Figure9. Normalized Maximum Transient Thermal Impedance

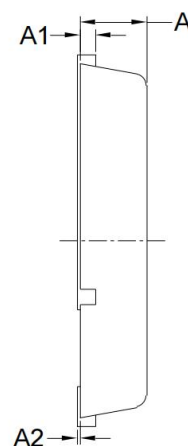
PDFN5*6-8L Package Information



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.	