

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
30V	2.0mΩ@10V	150A
	3.3mΩ@4.5V	

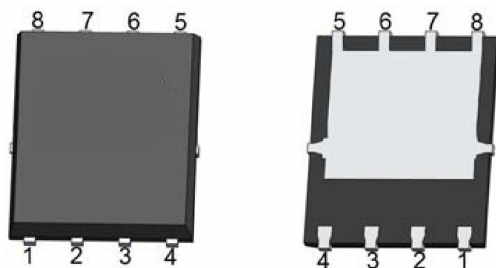
Feature

- Trench power MV MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(on)}$
- Suffix "-Q1" for AEC-Q101

Application

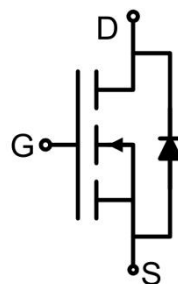
- DC-DC converter
- Power management functions
- Backlighting

Package

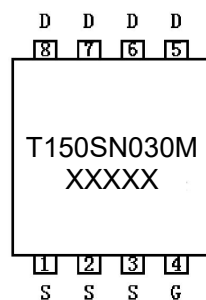


PDFN5*6-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}\text{C}$)	I_D	150	A
Continuous Drain Current ($T_C=100^{\circ}\text{C}$)	$I_D(100^{\circ}\text{C})$	95	A
Pulsed Drain Current ¹⁾	I_{DM}	400	A
Single Pulse Avalanche Energy ³⁾	E_{AS}	400	mJ
Power Dissipation ²⁾ ($T_C=25^{\circ}\text{C}$)	P_D	69	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	1.8	$^{\circ}\text{C}/\text{W}$
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	30			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =30V, 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	2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		1.58	2	mΩ
		V _{GS} =4.5V, I _D =20A		2.6	3.3	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f =1MHz		4498		pF
Output Capacitance	C _{oss}			800		
Reverse Transfer Capacitance	C _{rss}			643		
Total Gate Charge	Q _g	V _{DS} =15V, V _{GS} =10V, I _D =20A		92.7		nC
Gate-Source Charge	Q _{gs}			13.5		
Gate-Drain Charge	Q _{gd}			22.8		
Turn-on delay time	t _{d(on)}	V _{DS} =20V, V _{GS} =10V, I _D =4A R _G =3Ω, R _L =0.75Ω		11		nS
Turn-on rise time	t _r			80		
Turn-off delay time	t _{d(off)}			39		
Turn-off fall time	t _f			92		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				150	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =20A			1.2	V
Reverse Recovery Time	T _{rr}	I _F =20A, di/dt =500A/μs		15		nS
Reverse Recovery Charge	Q _{rr}			3		nC

Notes:

- 1) Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.
- 2) The power dissipation P_D is based on $T_{J(MAX)}=150^{\circ}\text{C}$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.
- 3) $T_J=25^{\circ}\text{C}$, $V_{DD}=30\text{V}$, $V_G=10\text{V}$, $L=2.0\text{mH}$, $I_{AS}=20\text{A}$.
- 4) Guaranteed by design, not subject to production.

Typical Characteristics

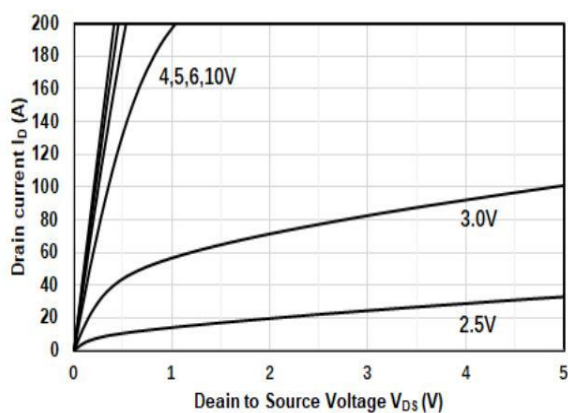


Figure1. Output Characteristics

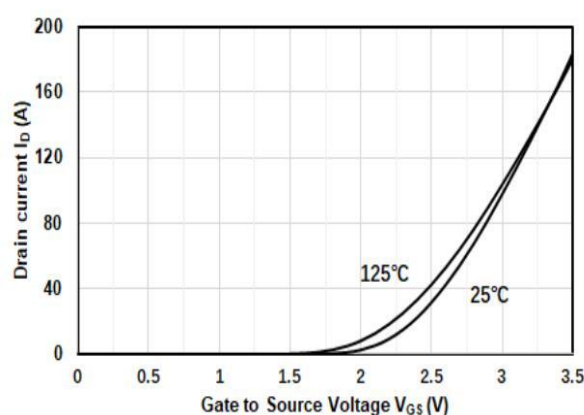


Figure2. Transfer Characteristics

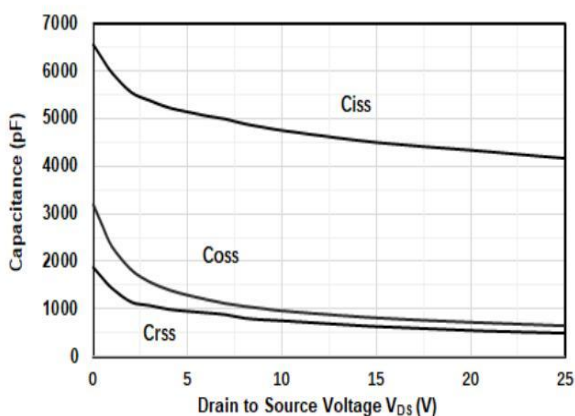


Figure3. Capacitance Characteristics

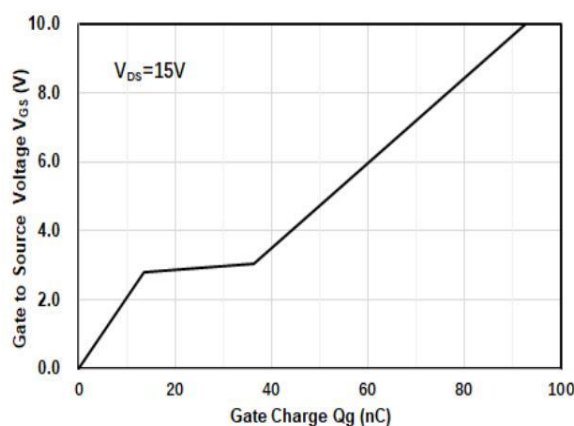


Figure4. Gate Charge

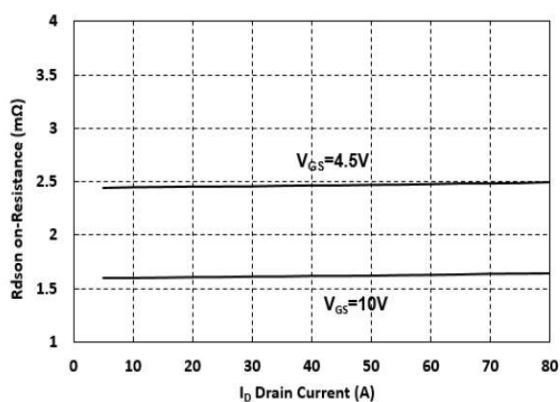


Figure5. Drain-Source on Resistance

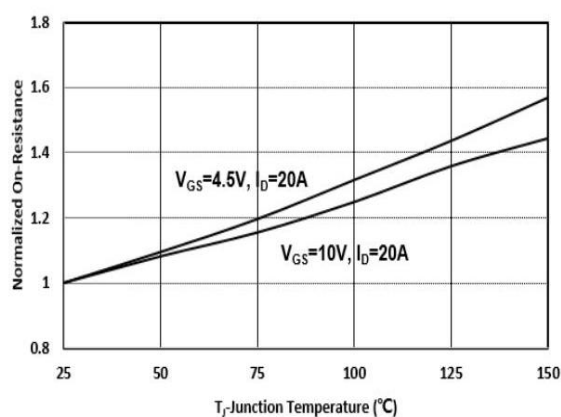


Figure6. Drain-Source on Resistance

Typical Characteristics

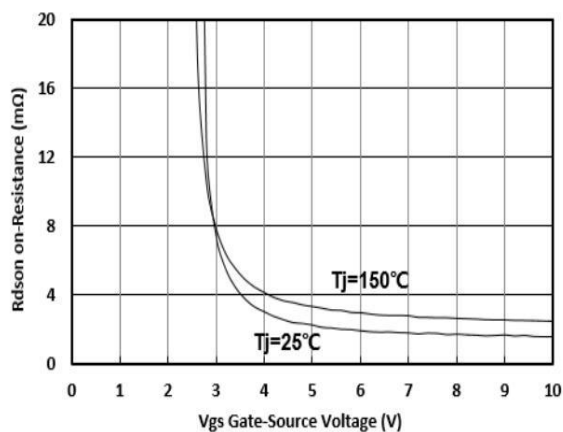


Figure7. On-Resistance vs V_{GS}

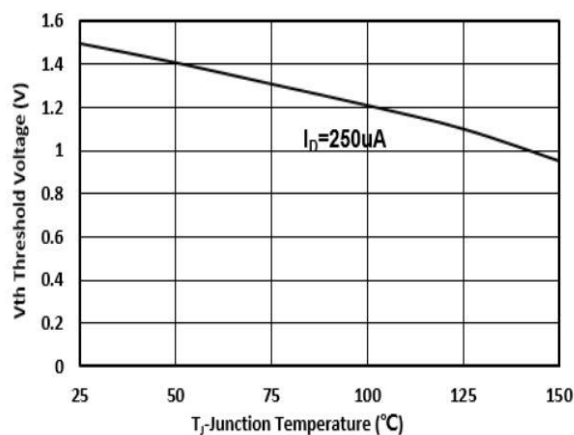


Figure8. V_{th} vs Temperature

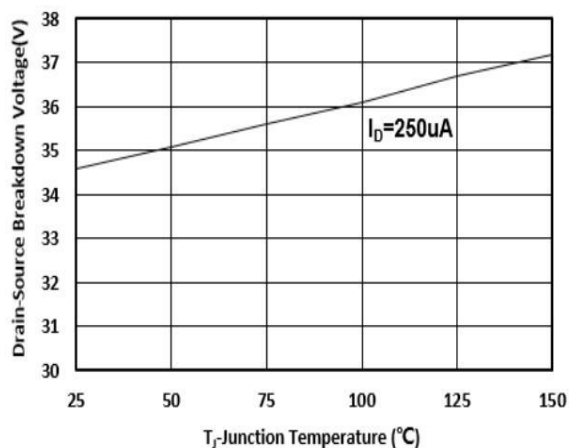


Figure9. Breakdown Voltage vs Temperature

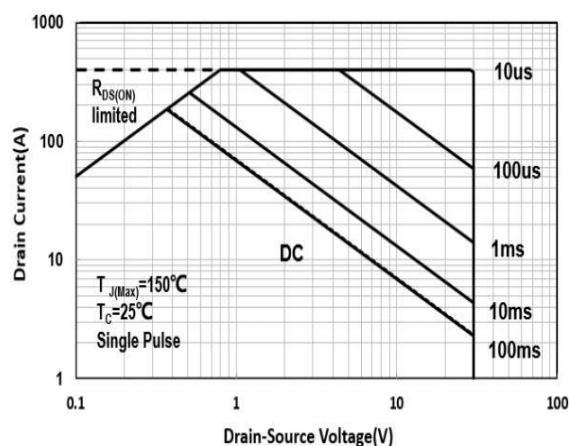


Figure10. Safe Operation Area

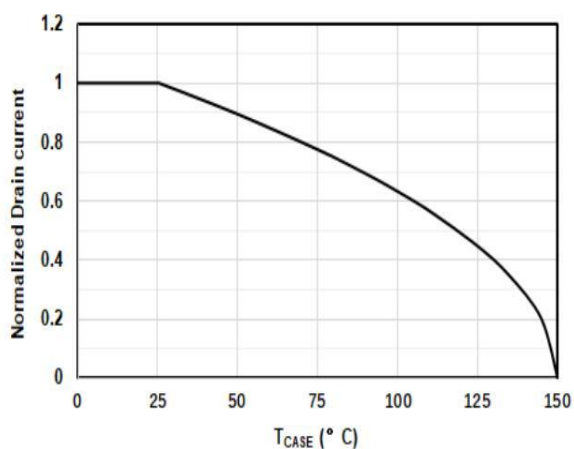


Figure11. Drain current vs. Case Temperature

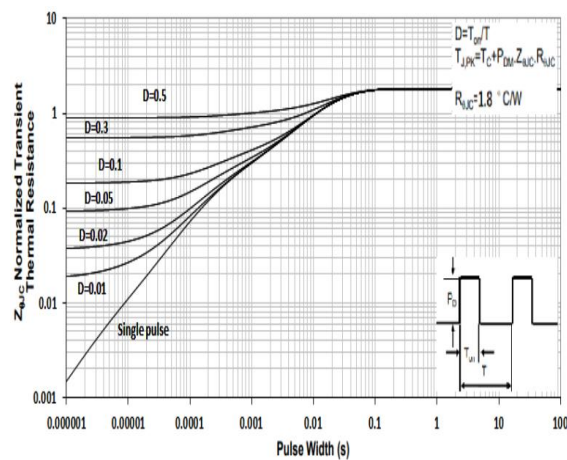
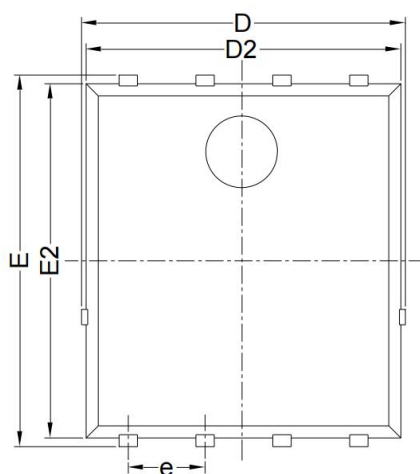
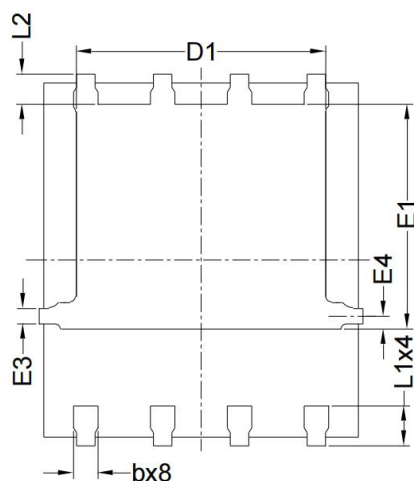


Figure12. Normalized Maximum Transient Thermal Impedance

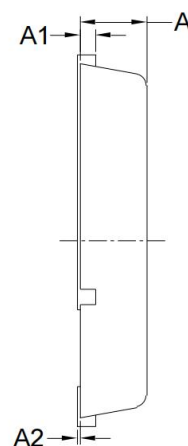
PDFN5*6-8L Package Information



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.	