

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	5.0m Ω @10V	60A

Feature

- Split Gate Trench Technology
- Low $R_{DS(on)}$
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested
- 100% ΔV_{DS} Tested

Application

- DC/DC Converter
- Synchronous Rectification
- High-Frequency Switch

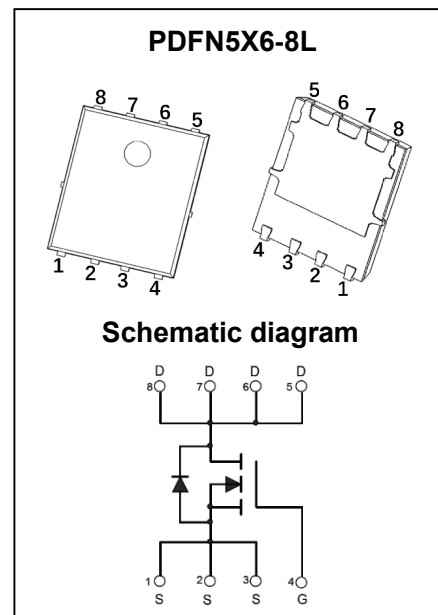
MARKING:



T050N04N= Device Code

XX = Date Code

Solid Dot = Green Indicator



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ 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	T _C = 25°C	I _D	60	A
	T _C = 100°C	I _D	39	
Pulsed Drain Current ²		I _{DM}	240	A
Single Pulsed Avalanche Current ³		I _{AS}	19	A
Single Pulsed Avalanche Energy ³		E _{AS}	90	mJ
Power Dissipation ⁵	T _C = 25°C	P _D	55	W
Thermal Resistance from Junction to Ambient ⁶		R _{θJA}	58	°C/W
Thermal Resistance from Junction to Case		R _{θJC}	2.3	°C/W
Junction Temperature		T _J	150	°C
Storage Temperature		T _{STG}	-55~ +150	°C

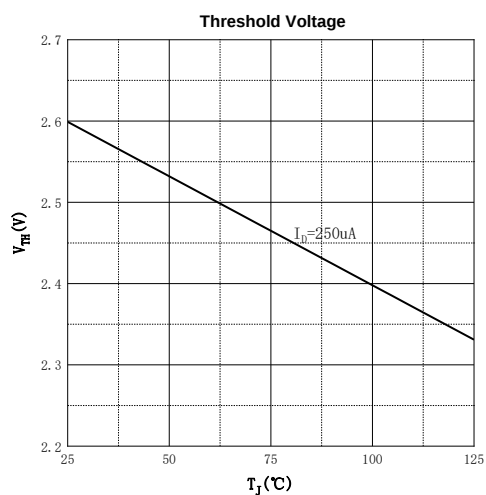
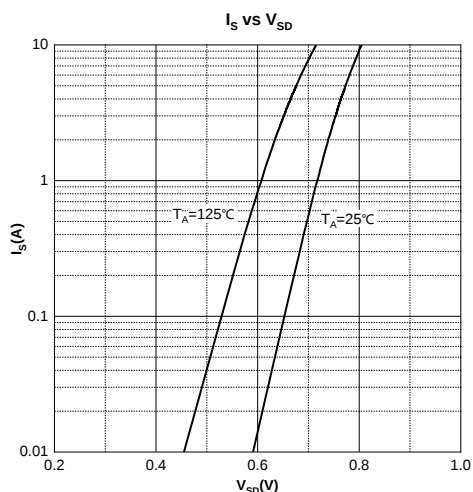
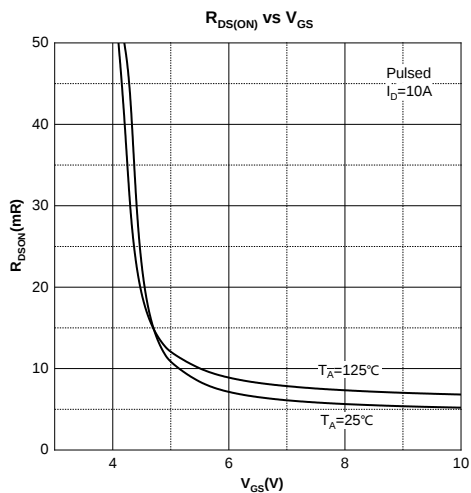
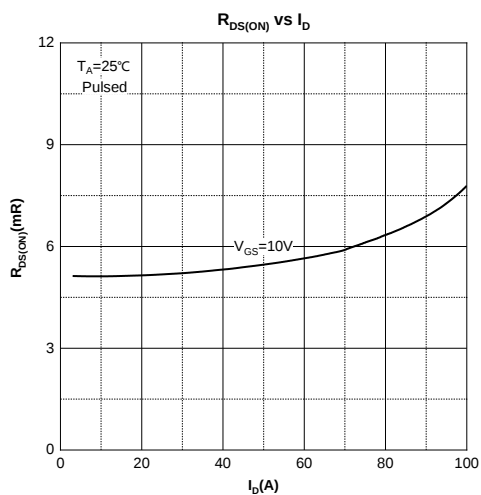
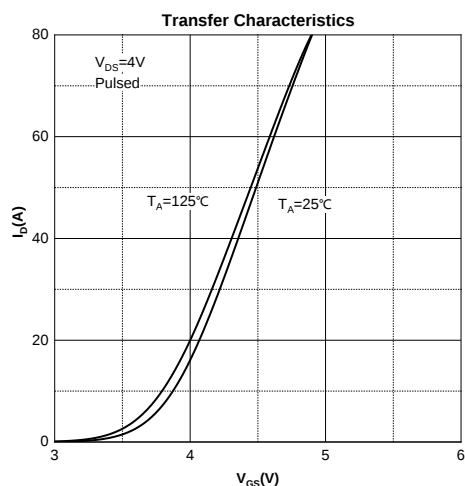
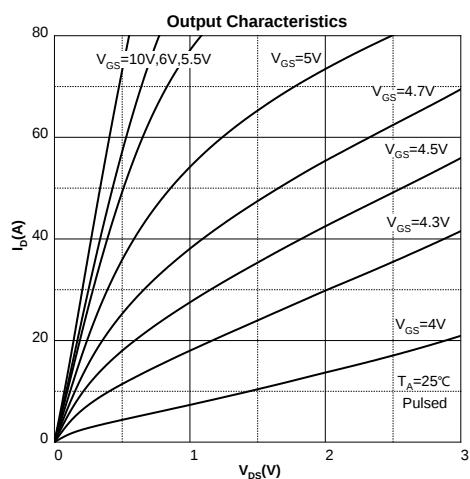
MOSFET ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

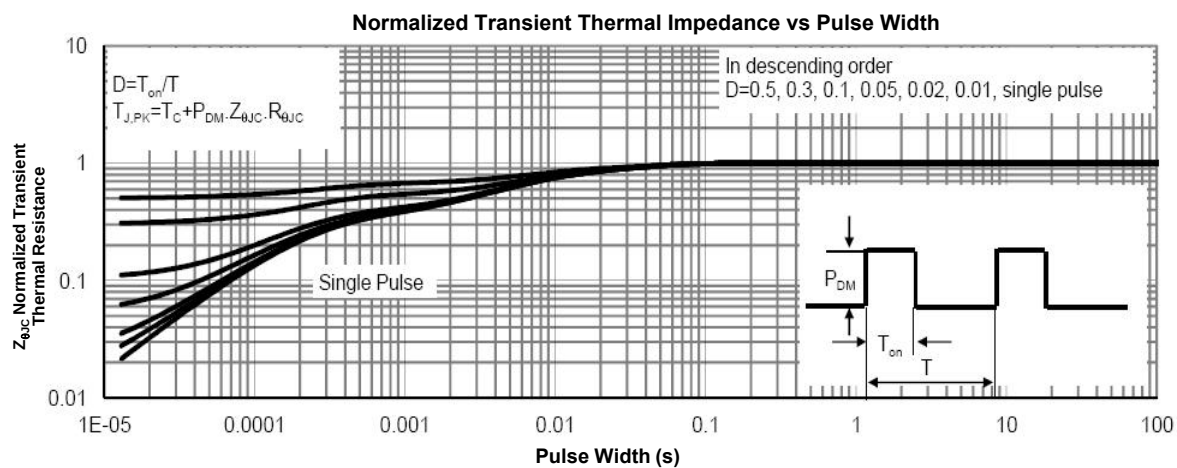
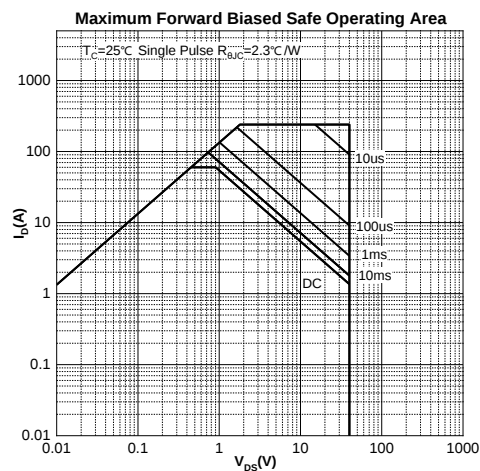
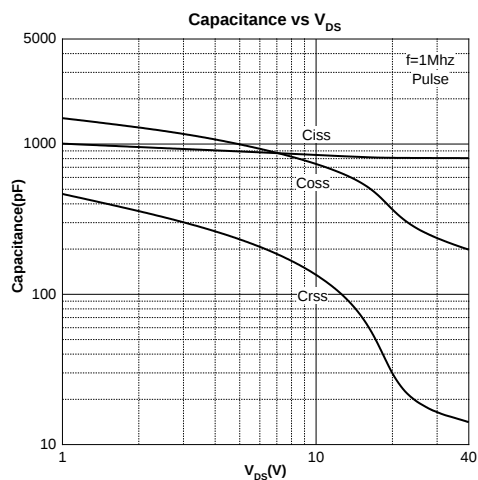
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	40			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 40V, V _{GS} = 0V			1	μA
Gate - Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
On Characteristics ⁴						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2.0	2.6	4.0	V
Drain-source On-resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 10A		5.0	8.0	mΩ
Forward Transconductance	g _{FS}	V _{DS} = 5V, I _D = 10A		34		S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 20V, V _{GS} = 0V, f = 1MHz		829		pF
Output Capacitance	C _{oss}			372		
Reverse Transfer Capacitance	C _{rss}			28		
Gate Resistance	R _g	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz		3.0		Ω
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = 40V, V _{GS} = 10V, I _D = 10A		19		nC
Gate-source Charge	Q _{gs}			3.3		
Gate-drain Charge	Q _{gd}			6.5		
Turn-on Delay Time	t _{d(on)}	V _{DD} = 20V, V _{GS} = 10V, I _D = 20A R _G = 1.6Ω		10		ns
Turn-on Rise Time	t _r			32		
Turn-off Delay Time	t _{d(off)}			27		
Turn-off Fall Time	t _f			12		
Source - Drain Diode Characteristics						
Diode Forward Voltage ⁴	V _{SD}	V _{GS} = 0V, I _S = 10A			1.0	V

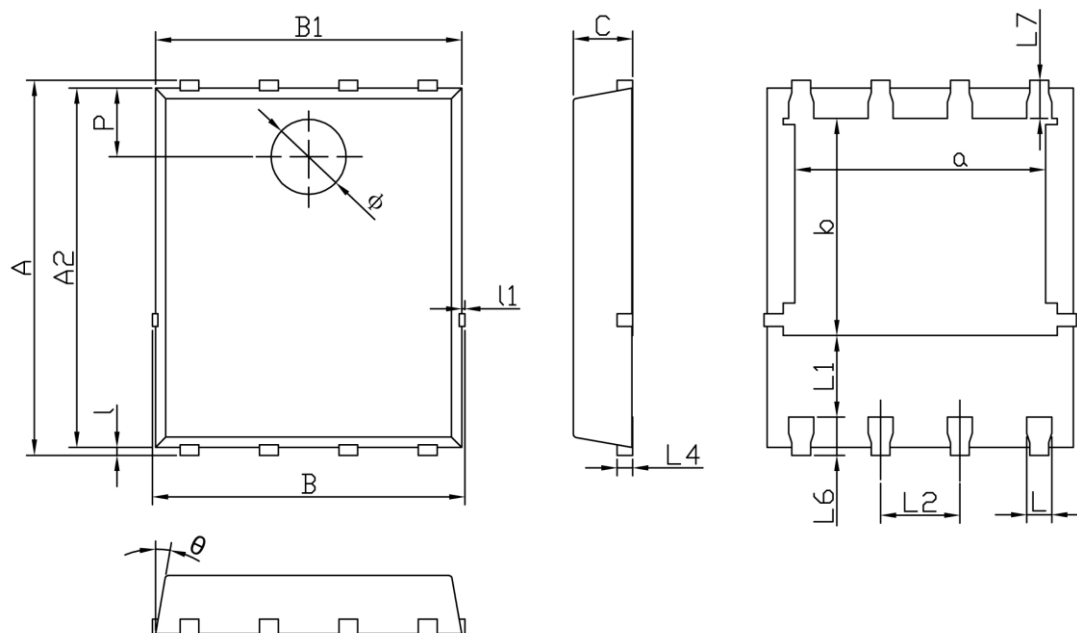
Notes :

- 1.The maximum current rating is limited by package.And device mounted on a large heatsink
- 2.Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.
- 3.EAS condition: V_{DD} = 20V, V_{GS} = 10V, L = 0.5mH, R_G = 25Ω Starting T_J = 25°C.
- 4.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.
- 5.The power dissipation P_D is limited by T_{J(MAX)} = 150°C.And device mounted on a large heatsink
- 6.Device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A = 25°C.

Typical Characteristics





PDFN5X6-8L Package Information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	5.900	6.100	0.232	0.240
a	3.910	4.110	0.154	0.162
A2	5.700	5.800	0.224	0.228
B	4.900	5.100	0.193	0.201
b	3.370	3.570	0.133	0.141
B1	4.800	5.000	0.189	0.197
C	0.900	1.000	0.035	0.039
L	0.350	0.450	0.014	0.018
l	0.060	0.200	0.002	0.008
L1	1.100	-	0.043	-
l1	-	0.100	-	0.004
L2	1.170	1.370	0.046	0.054
L4	0.210	0.340	0.008	0.013
L6	0.510	0.710	0.020	0.028
L7	0.510	0.710	0.020	0.028
P	1.000	1.200	0.039	0.047
Φ	1.100	1.300	0.043	0.051
θ	8°	12°	8°	12°