

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	6.5mΩ@40V	46A

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

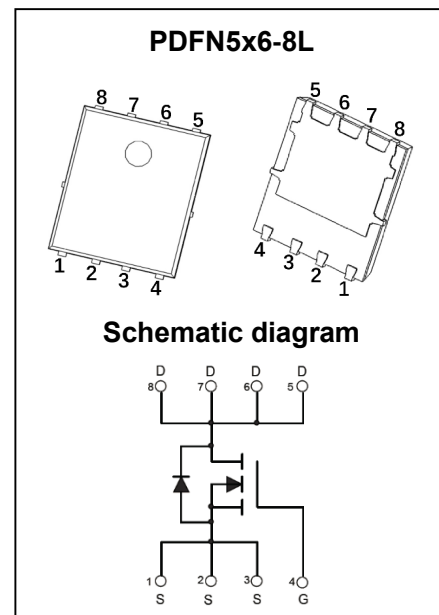
MARKING:



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	46	A
	T _C = 100°C	I _D	30	
Pulsed Drain Current ²		I _{DM}	184	A
Single Pulsed Avalanche Current ³		I _{AS}	20	A
Single Pulsed Avalanche Energy ³		E _{AS}	97	mJ
Power Dissipation ⁵	T _C = 25°C	P _D	33	W
Thermal Resistance from Junction to Ambient ⁶		R _{θJA}	56	°C/W
Thermal Resistance from Junction to Case		R _{θJC}	3.8	°C/W
Junction Temperature		T _J	150	°C
Storage Temperature		T _{STG}	-55~ +150	°C

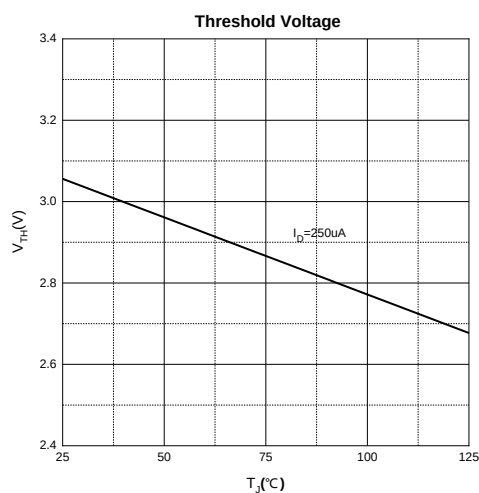
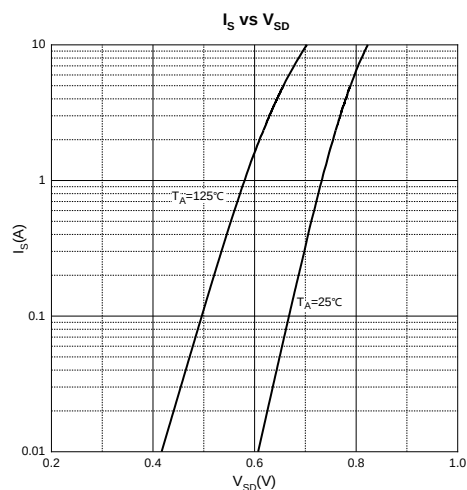
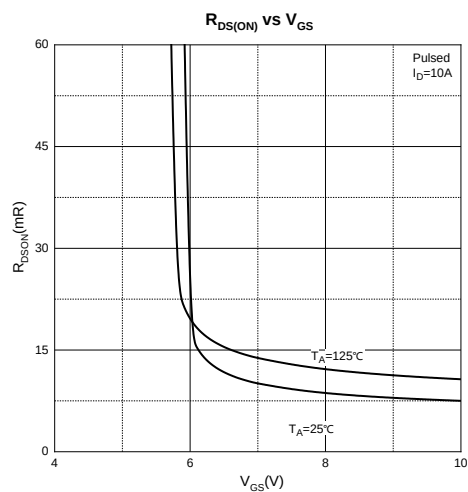
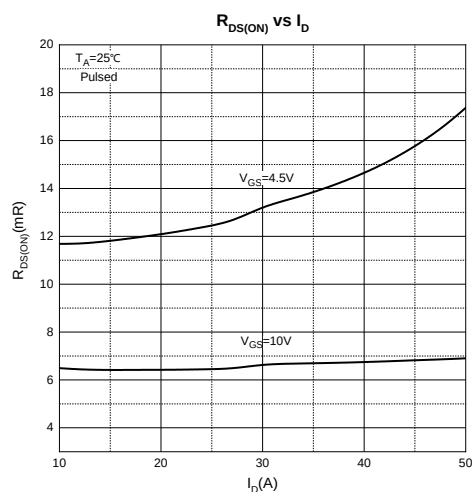
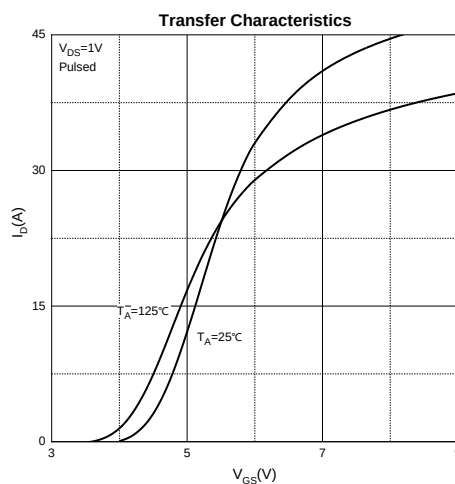
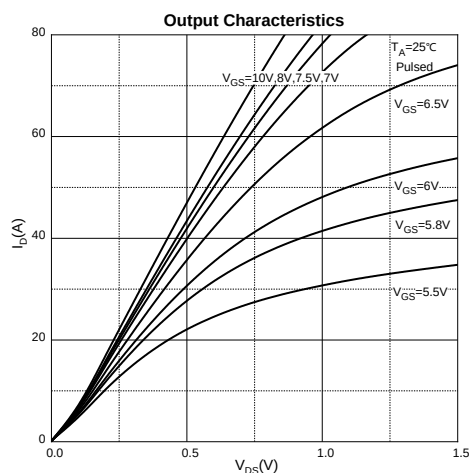
MOSFET ELECTRICAL CHARACTERISTICS ($T_J = 25^{\circ}\text{C}$ unless otherwise noted)

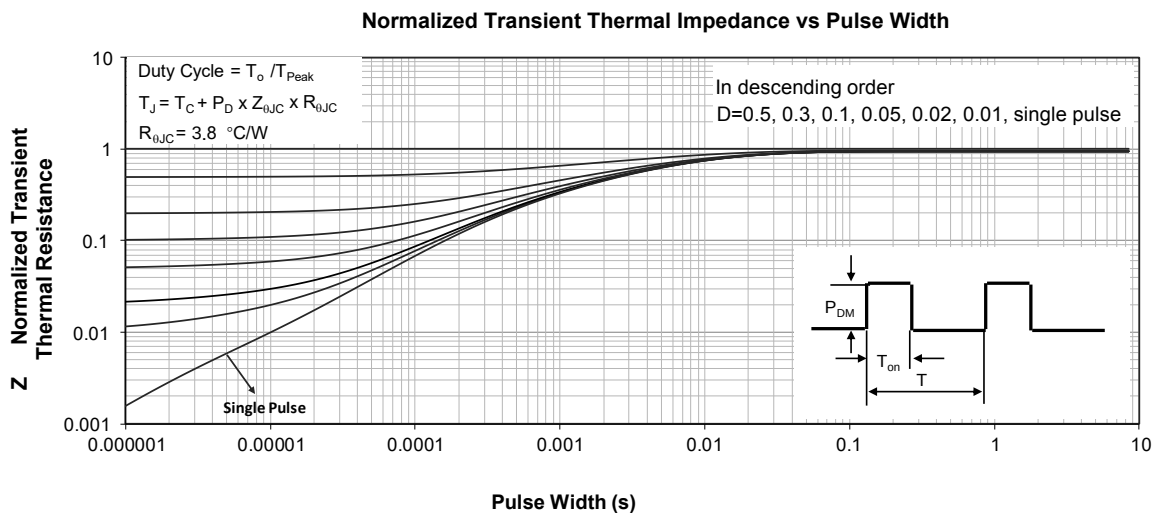
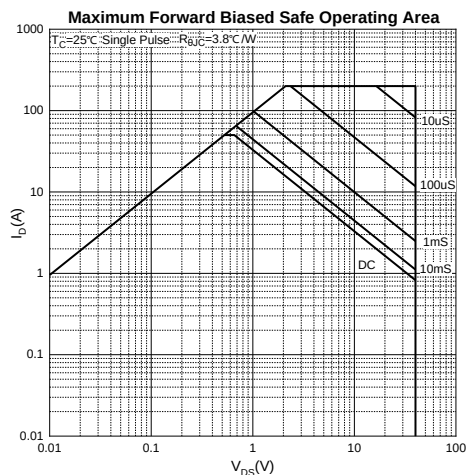
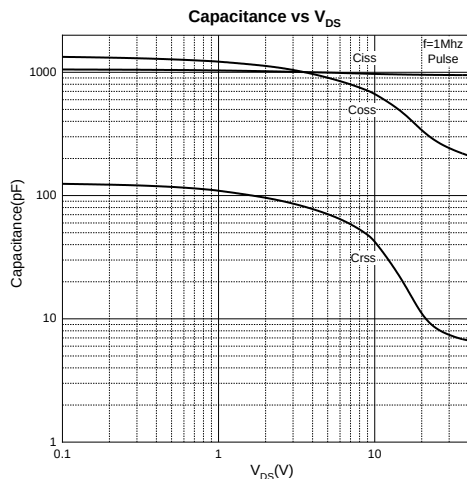
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 40V, V_{GS} = 0V$			1	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics ⁴						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	3.0	4.0	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 10A$		6.5	8.0	m Ω
Forward Transconductance	g_{FS}	$V_{DS} = 5V, I_D = 10A$		34		S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 20V, V_{GS} = 0V, f = 1MHz$		955		pF
Output Capacitance	C_{oss}			334		
Reverse Transfer Capacitance	C_{rss}			90		
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		2.0		Ω
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = 40V, V_{GS} = 10V, I_D = 10A$		14.6		nC
Gate-source Charge	Q_{gs}			4.4		
Gate-drain Charge	Q_{gd}			4.5		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 20V, V_{GS} = 10V, I_D = 12A$ $R_G = 3\Omega$		14		ns
Turn-on Rise Time	t_r			5		
Turn-off Delay Time	$t_{d(off)}$			18		
Turn-off Fall Time	t_f			11		
Source - Drain Diode Characteristics						
Diode Forward Voltage ⁴	V_{SD}	$V_{GS} = 0V, I_S = 10A$			1.0	V

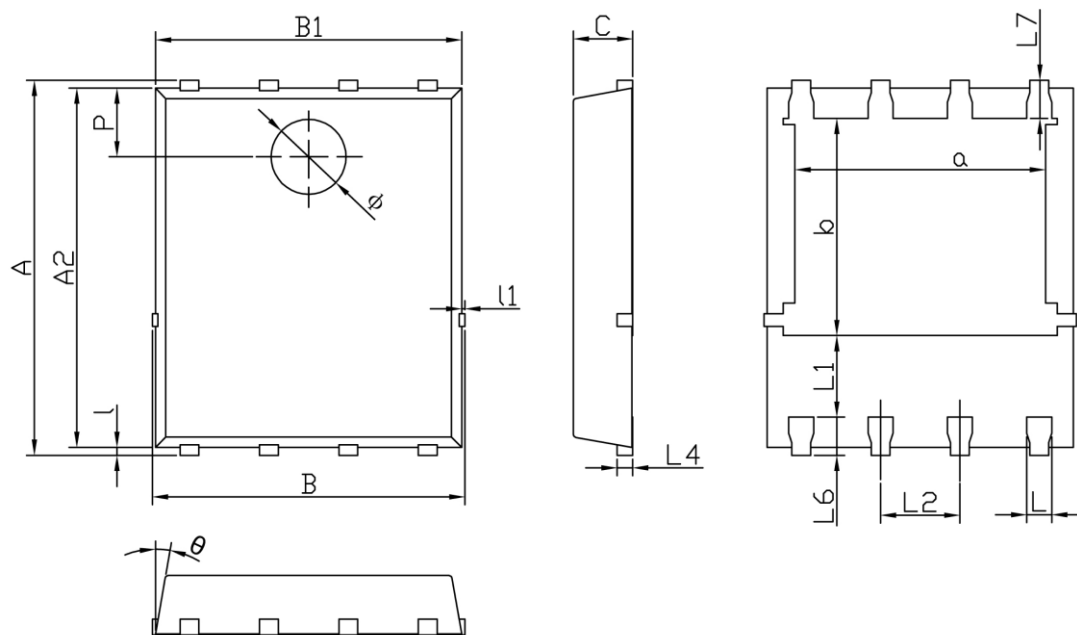
Notes :

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

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°