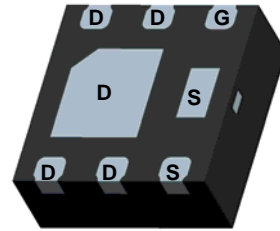
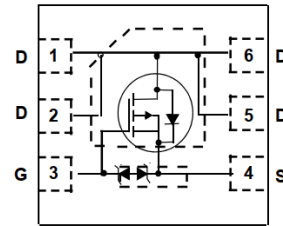


WPM2065A
Single P-Channel, -20V, -9.4A, Power MOSFET
[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)

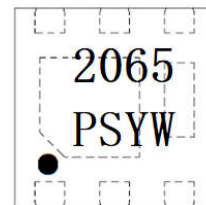
V_{DS} (V)	Max. $R_{DS(on)}$ (m Ω)
-20	21 @ $V_{GS}=-4.5V$
	28 @ $V_{GS}=-2.5V$
	43 @ $V_{GS}=-1.8V$
ESD Rating: 2000V HBM	


DFN2x2-6L
Descriptions

The WPM2065A is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WPM2065A is Pb-free.


Pin configuration (Top view)
Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage
- ESD protection
- Small package DFN2x2-6L



2065 = Device Code
 PS = Special Code
 YW = Year& Week(A~z)

Applications

- DC/DC converters
- Power supply converters circuit
- Load/Power Switching for portable device
- Driver for Relay, Solenoid, Motor, LED etc
- Charging

Marking
Order information

Device	Package	Shipping
WPM2065A-6/TR	DFN2x2-6L	3000/Tape&Reel

Absolute Maximum ratings

Parameter	Symbol	10 s	Steady State	Unit	
Drain-Source Voltage	V_{DS}	-20		V	
Gate-Source Voltage	V_{GS}	± 10			
Continuous Drain Current	I_D	$T_A=25^\circ\text{C}$	-9.4	-7.2	A
		$T_A=70^\circ\text{C}$	-7.5	-5.8	
Maximum Power Dissipation ^b	P_D	$T_A=25^\circ\text{C}$	2.8	1.6	W
		$T_A=70^\circ\text{C}$	1.8	1.0	
Pulsed Drain Current ^c	I_{DM}	-50		A	
Operating Junction Temperature	T_J	-55 to 150		$^\circ\text{C}$	
Storage Temperature Range	T_{STG}	-55 to 150		$^\circ\text{C}$	

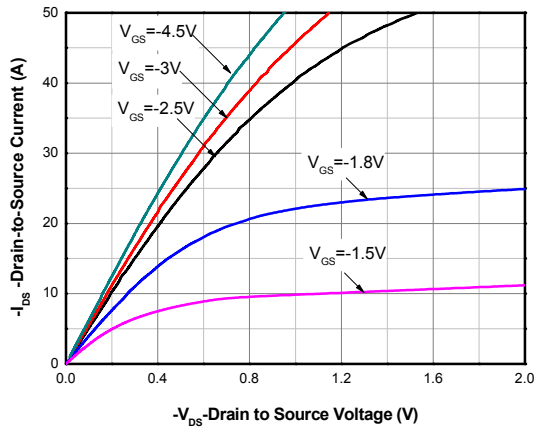
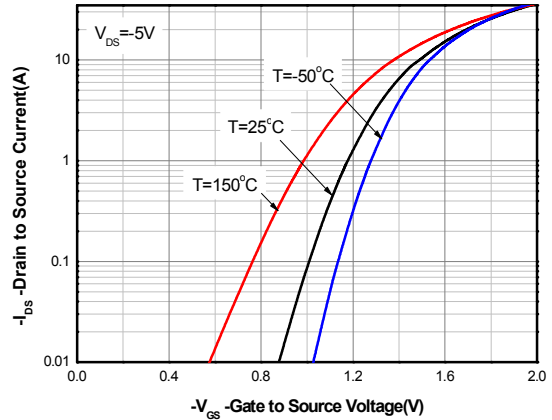
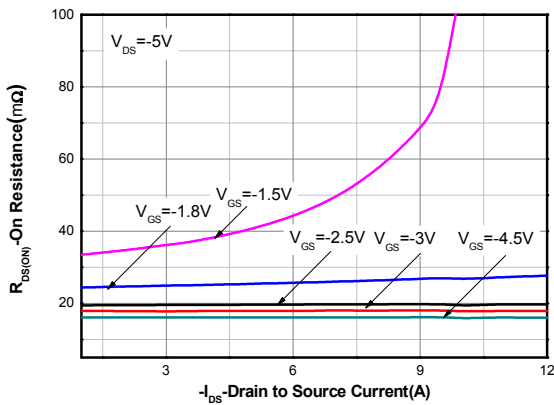
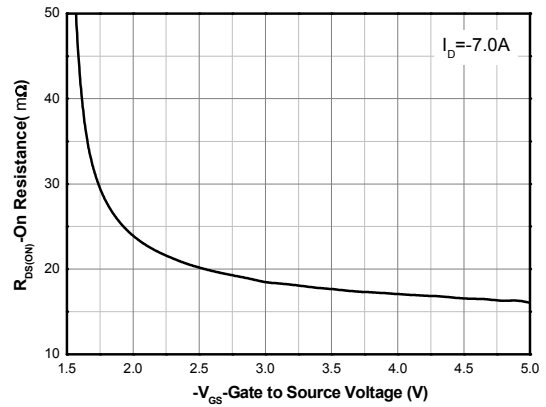
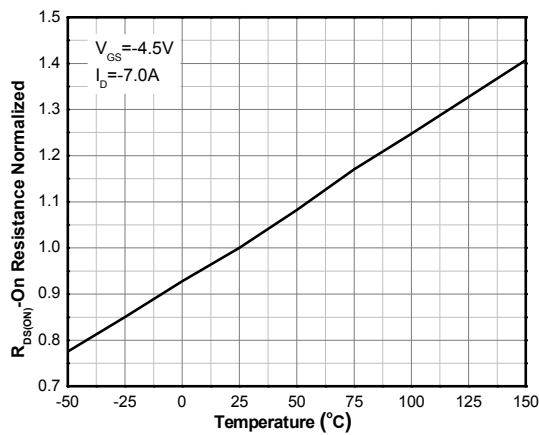
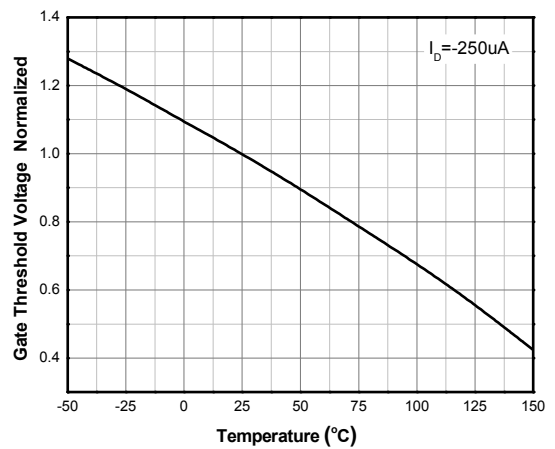
Thermal resistance ratings

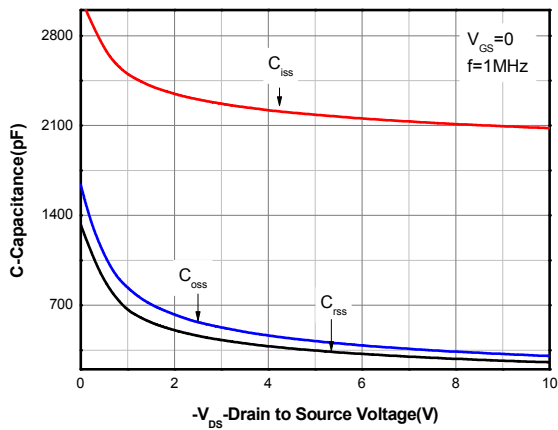
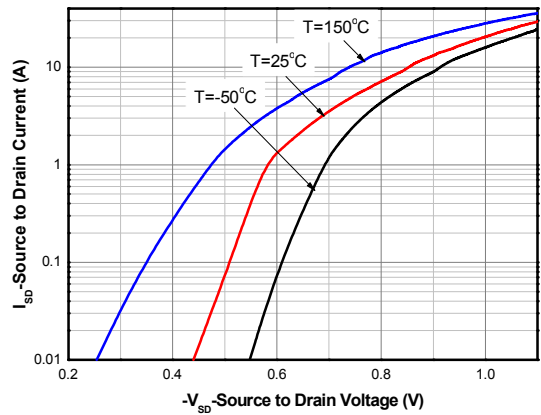
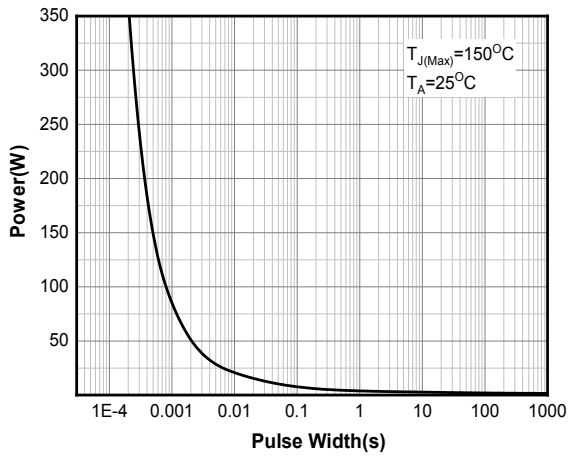
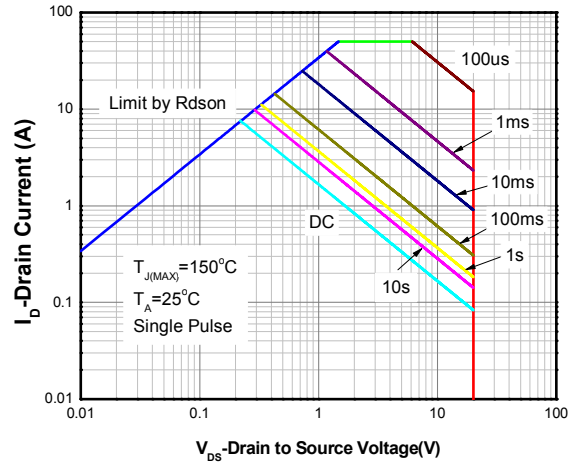
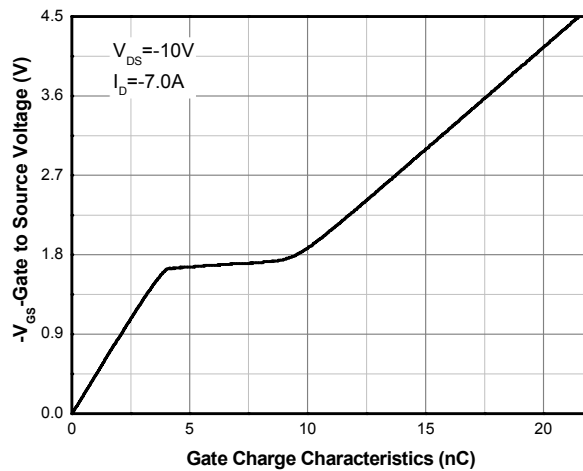
Single Operation					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ^a	$t \leq 10\text{ s}$	$R_{\theta JA}$	36	44	$^\circ\text{C/W}$
	Steady State		63	75	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	8	9	

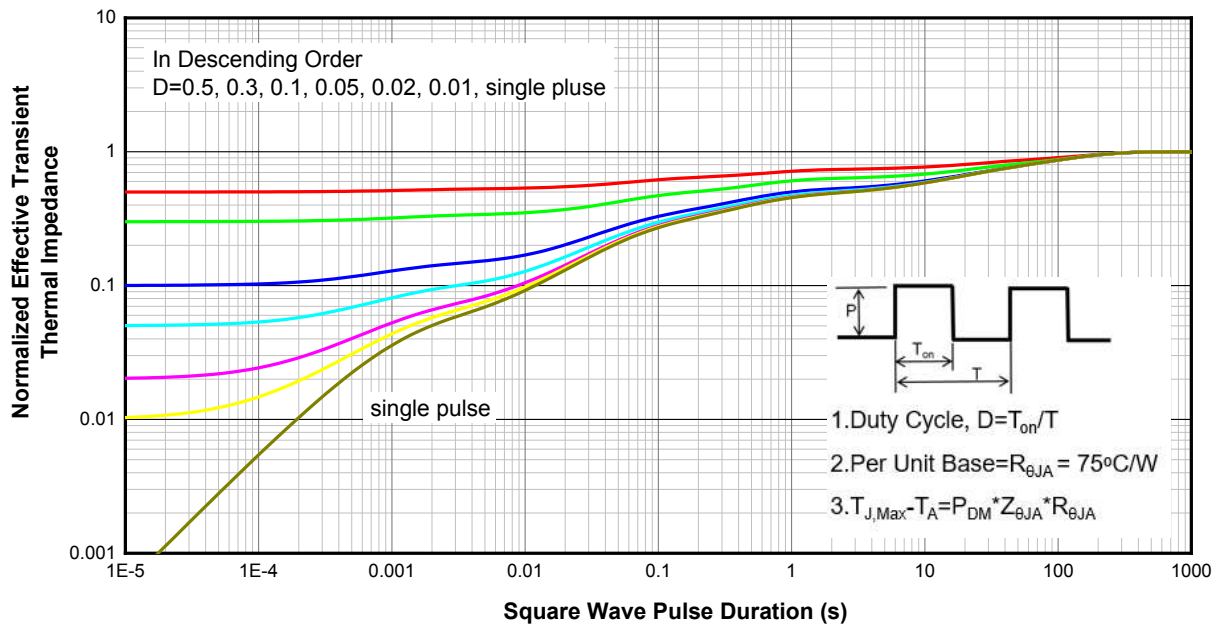
- FR-4 board (38mm X 38mm X t1.6mm, 70um Copper) partially covered with copper (645mm² area).
- The power dissipation P_D is based on Junction-to-Ambient thermal resistance $R_{\theta JA}$ $t \leq 10\text{s}$ value and the $T_{J(\text{MAX})}=150^\circ\text{C}$.
- Repetitive rating, ~10us pulse width, duty cycle ~1%, keep initial $T_J = 25^\circ\text{C}$, the maximum allowed junction temperature of 150°C .
- The static characteristics are obtained using ~380us pulses, duty cycle ~1%.

Electronics Characteristics (Ta=25°C, unless otherwise noted)

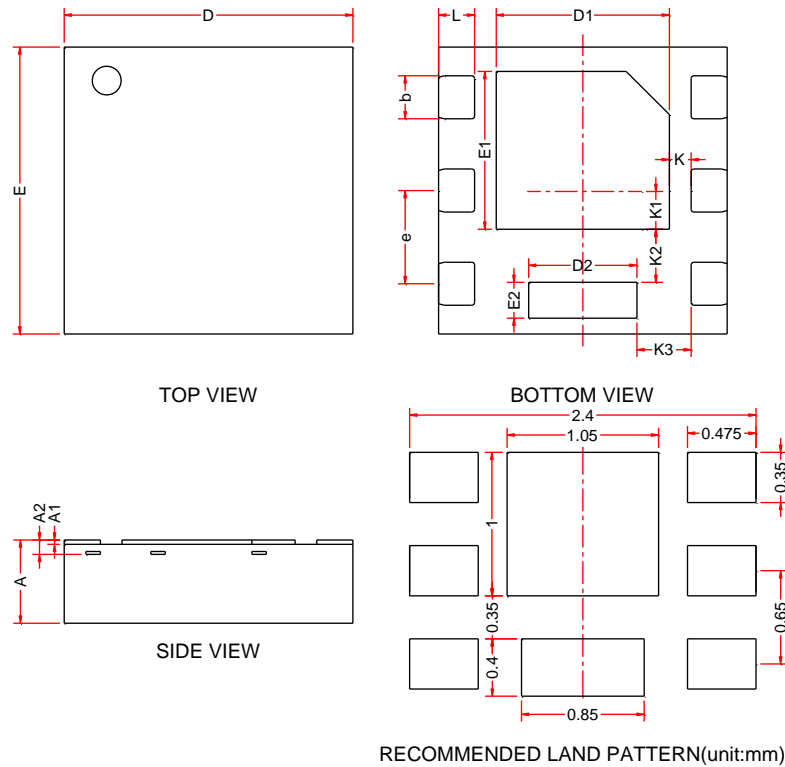
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = -250\mu\text{A}$	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -16\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
Gate-to-source Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 10\text{ V}$			± 10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -250\mu\text{A}$	-0.4	-0.7	-1	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS} = -4.5\text{ V}, I_D = -7\text{ A}$		16.5	21	m Ω
		$V_{GS} = -2.5\text{ V}, I_D = -5\text{ A}$		20	28	
		$V_{GS} = -1.8\text{ V}, I_D = -3\text{ A}$		26	43	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}, V_{DS} = -10\text{ V}$		2080		pF
Output Capacitance	C_{OSS}			304		
Reverse Transfer Capacitance	C_{RSS}			255		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = -4.5\text{ V}, V_{DS} = -10\text{ V}, I_D = -7\text{ A}$		21.5		nC
Threshold Gate Charge	$Q_{G(TH)}$			1.6		
Gate-to-Source Charge	Q_{GS}			4.1		
Gate-to-Drain Charge	Q_{GD}			4.5		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_d(ON)$	$V_{GS} = -4.5\text{ V}, V_{DS} = -10\text{ V}, R_L = 3\Omega, R_G = 6\Omega$		17.7		ns
Rise Time	t_r			53.7		
Turn-Off Delay Time	$t_d(OFF)$			116.2		
Fall Time	t_f			90.2		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = -1\text{ A}$		-0.8	-1.5	V

Typical Characteristics (Ta=25°C, unless otherwise noted)

Output characteristics

Transfer Characteristics

On-Resistance vs. Drain current

On-Resistance vs. Gate-to-Source Voltage

On-Resistance vs. Junction Temperature

Threshold Voltage vs. Temperature

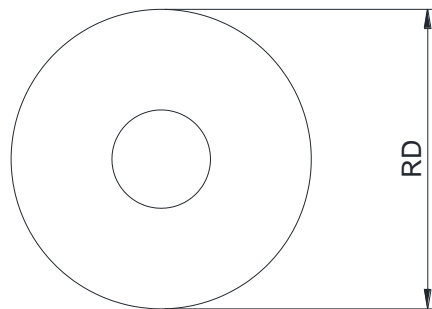
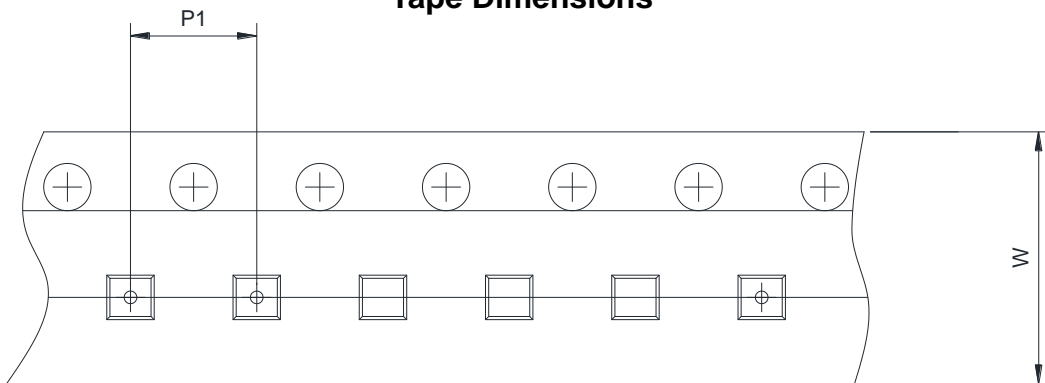
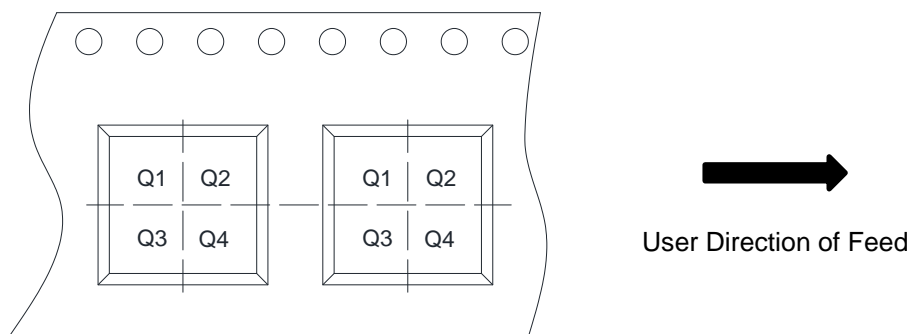

Capacitance

Body Diode Forward Voltage

Single pulse power

Safe operating power

Gate Charge Characteristics



Transient Thermal Response (Junction-to-Ambient)

PACKAGE OUTLINE DIMENSIONS
DFN2x2-6L


Symbol	Dimensions in Millimeters		
	Min.	Nom	Max.
A	0.50	---	0.65
A1	0.00	0.02	0.05
A2	0.10REF		
b	0.25	0.30	0.35
D	1.90	2.00	2.10
D1	1.10	1.20	1.30
D2	0.65	0.75	0.85
E	1.90	2.00	2.10
E1	1.00	1.10	1.20
E2	0.15	0.25	0.35
e	0.65BSC		
L	0.20	0.25	0.30
K	0.05	0.15	0.25
K1	0.17	0.27	0.37
K2	0.27	0.37	0.47
K3	0.28	0.38	0.48

TAPE AND REEL INFORMATION
Reel Dimensions

Tape Dimensions

Quadrant Assignments For PIN1 Orientation In Tape


RD	Reel Dimension	<input checked="" type="checkbox"/> 7 inch	<input type="checkbox"/> 13 inch
W	Overall width of the carrier tape	<input checked="" type="checkbox"/> 8 mm	<input type="checkbox"/> 12 mm <input type="checkbox"/> 16 mm
P1	Pitch between successive cavity centers	<input type="checkbox"/> 2 mm	<input checked="" type="checkbox"/> 4 mm <input type="checkbox"/> 8 mm
Pin1	Pin1 Quadrant	<input checked="" type="checkbox"/> Q1	<input type="checkbox"/> Q2 <input type="checkbox"/> Q3 <input type="checkbox"/> Q4