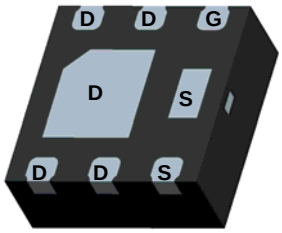
WPM2065

Single P-Channel, -20V, -6.9A, Power MOSFET

Http://www.sh-willsemi.com

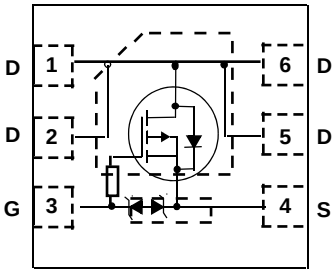
V_{DS} (V)	Typical Rds(on) (Ω)
-20	0.017@ V_{GS}=-4.5V
	0.022@ V_{GS}=-2.5V
	0.032@ V_{GS}=-1.8V
ESD Rating: 4000V HBM	



DFN2X2-6L

Descriptions

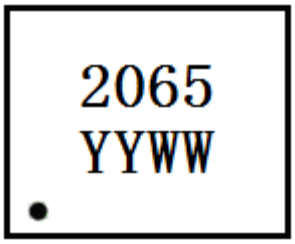
The WPM2065 is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS\ (ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WPM2065 is Pb-free and Halogen-free.



Pin configuration (Top view)

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance for higher DC current
- Extremely Low Threshold Voltage
- HBM ESD protection > 4kV
- Small package DFN2X2-6L



2065 = Device Code
YY = Year
WW = Week

Marking

Applications

- Driver for Relay, Solenoid, Motor, LED etc.
- DC-DC converter circuit
- Power Switch
- Load Switch
- Charging

Order information

Device	Package	Shipping
WPM2065-6/TR	DFN2X2-6L	3000/Reel&Tape

Absolute Maximum ratings

Parameter		Symbol	10 S	Steady State	Unit
Drain-Source Voltage		V_{DS}	-20		V
Gate-Source Voltage		V_{GS}	±8		
Continuous Drain Current [a d]	T_A=25°C	I_D	-6.9	-6.2	A
	T_A=70°C		-5.5	-5.0	
Maximum Power Dissipation [a d]	T_A=25°C	P_D	1.7	1.4	W
	T_A=70°C		1.1	0.9	
Continuous Drain Current [b d]	T_A=25°C	I_D	-5.5	-4.4	A
	T_A=70°C		-4.4	-3.5	
Maximum Power Dissipation [b d]	T_A=25°C	P_D	1.1	0.7	W
	T_A=70°C		0.7	0.4	
Pulsed Drain Current [c]		I_{DM}	-28		A
Operating Junction Temperature		T_J	-55 to 150		°C
Lead Temperature		T_L	260		°C
Storage Temperature Range		T_{stg}	-55 to 150		°C

Thermal resistance ratings

Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	57	72	°C/W
	Steady State		71	90	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	89	115	
	Steady State		126	181	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	34	44	

a Surface mounted on FR-4 Board using 1 square inch pad size, 1oz copper

b Surface mounted on FR-4 board using minimum pad size, 1oz copper

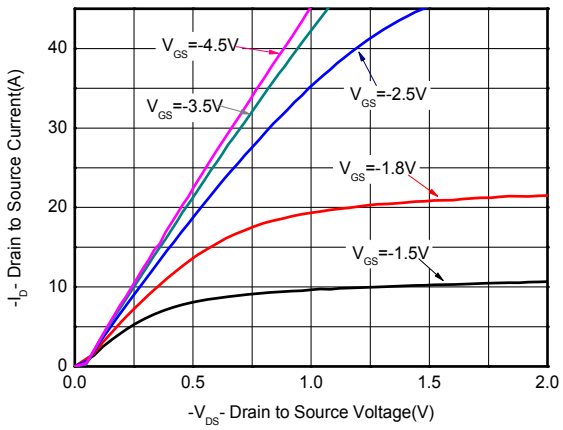
c Pulse width<380μs, Duty Cycle<2%

d Maximum junction temperature T_J=150°C.

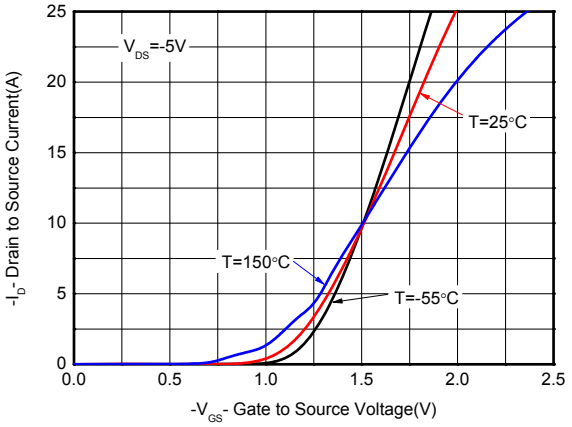
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = -250uA	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -16V, V_{GS} = 0V			-1	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} =±8V			±5	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = -250uA	-0.45	-0.65	-1.0	V
Drain-to-source On-resistance [b, c]	$R_{DS(on)}$	V_{GS} = -4.5V, I_D = -6.9A		17	24	mΩ
		V_{GS} = -2.5V, I_D = -6.1A		22	29	
		V_{GS} = -1.8V, I_D = -5.3A		32	45	
Forward Trans conductance	g_{fs}	V_{DS} = -5.0V, I_D = -6.9A		50		S
CAPACITANCES, CHARGES						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1.0 MHz, V_{DS} = -10 V		2026		pF
Output Capacitance	C_{OSS}			225		
Reverse Transfer Capacitance	C_{RSS}			201		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = -4.5 V, V_{DD} = -10 V, I_D = -6.9 A		23		nC
Threshold Gate Charge	$Q_{G(TH)}$			2.5		
Gate-to-Source Charge	Q_{GS}			4		
Gate-to-Drain Charge	Q_{GD}			6		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V_{GS} = -4.5 V, V_{DD} = -10 V, R_L=3 Ω, R_G=6 Ω		40		ns
Rise Time	tr			76		
Turn-Off Delay Time	td(OFF)			284		
Fall Time	tf			244		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = -6.9A		-0.8	-1.5	V

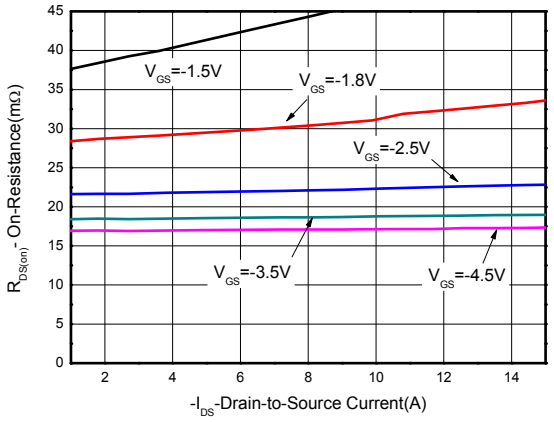
Typical Characteristics (Ta=25°C, unless otherwise noted)



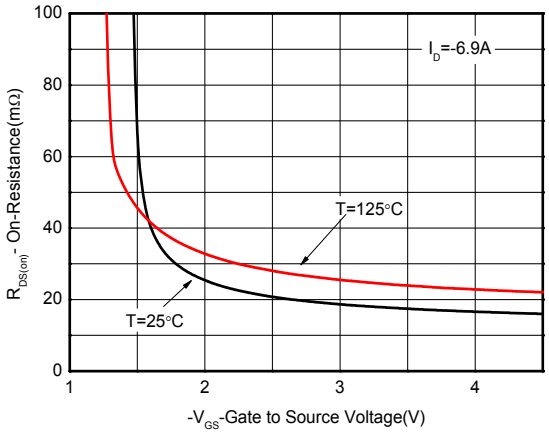
Output characteristics



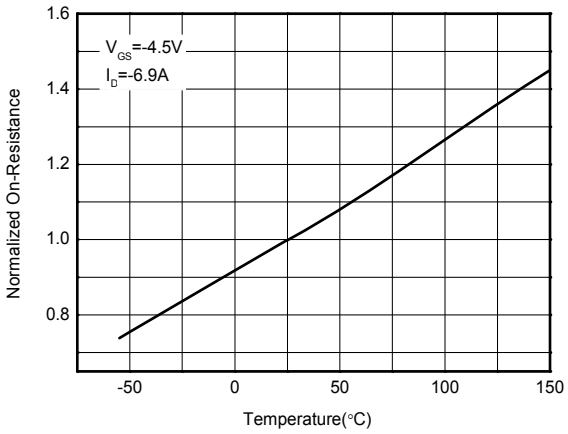
Transfer characteristics



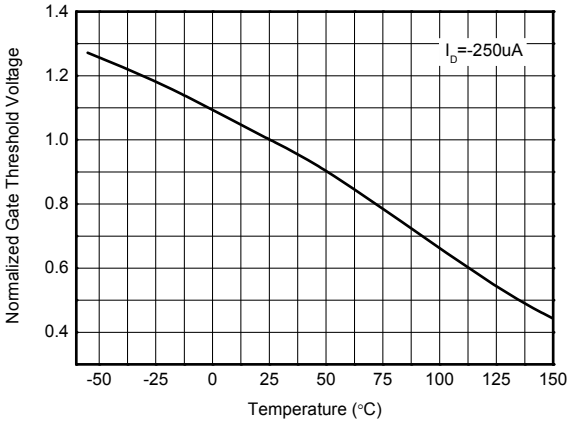
On-Resistance vs. Drain current



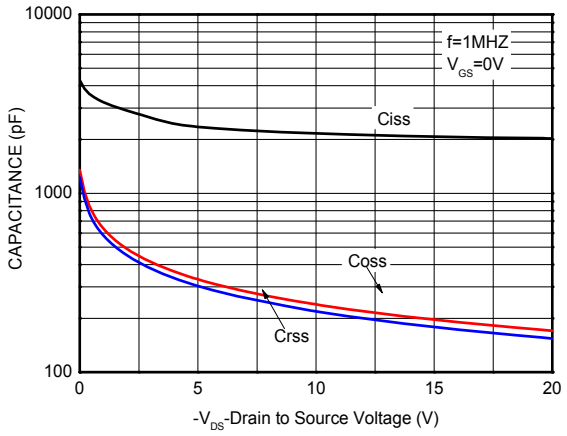
On-Resistance vs. Gate-to-Source voltage



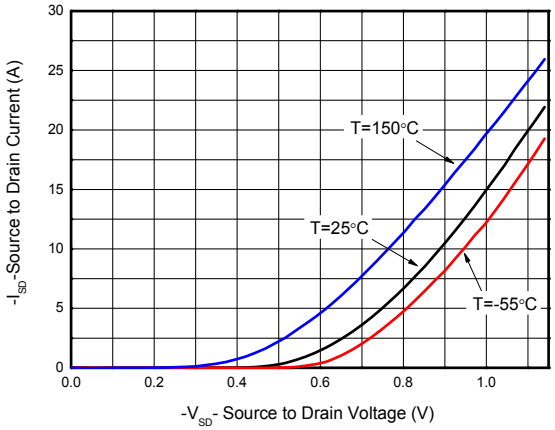
On-Resistance vs. Junction temperature



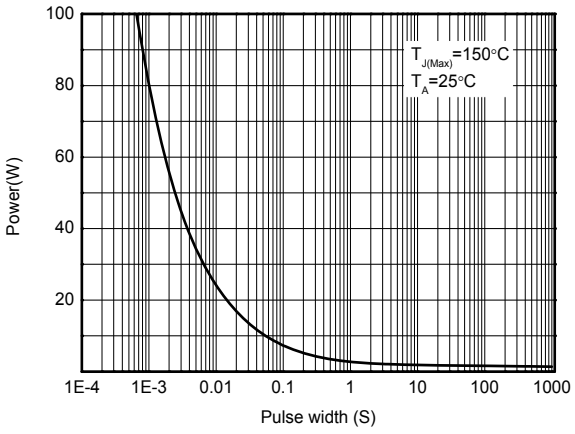
Threshold voltage vs. Temperature



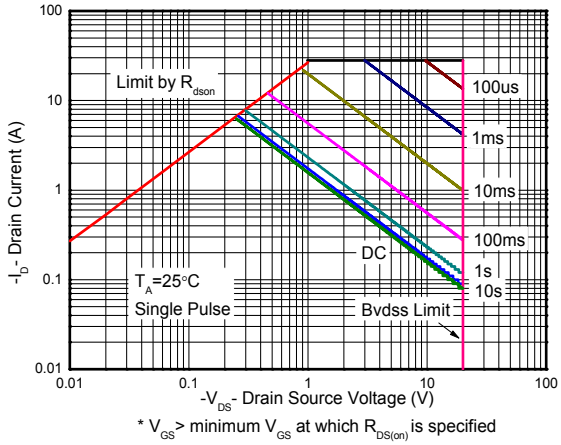
Capacitance



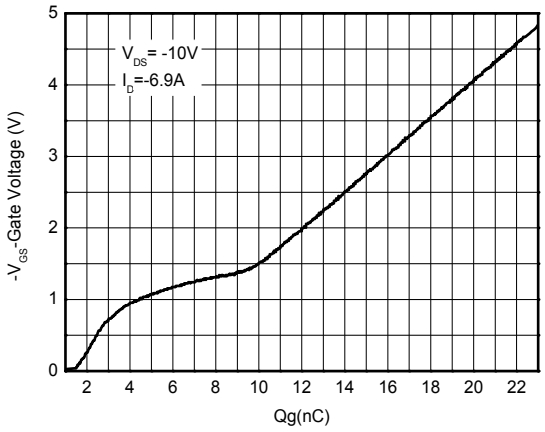
Body diode forward voltage



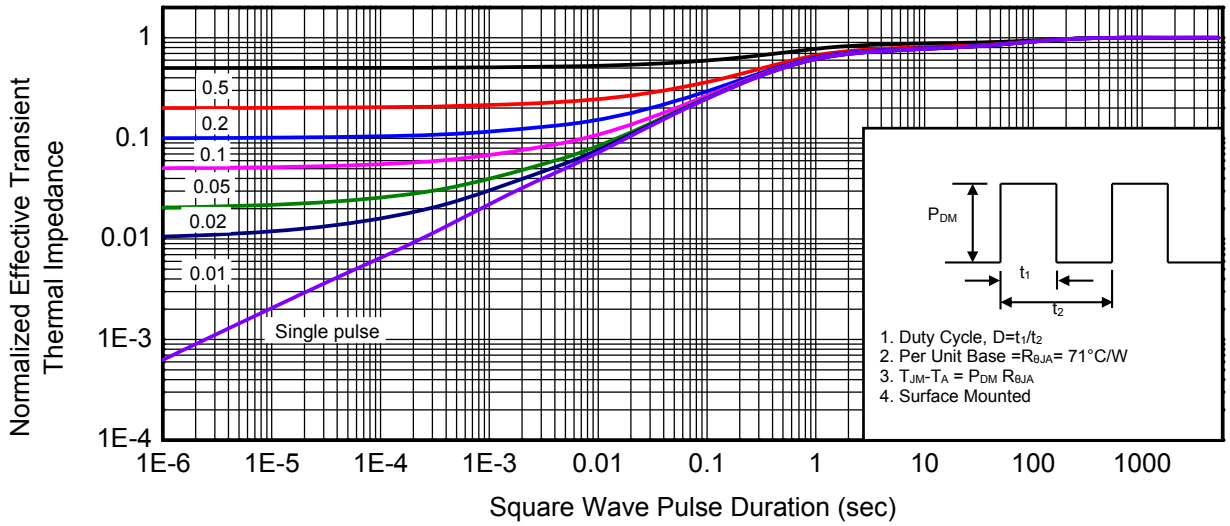
Single pulse power



Safe operating power



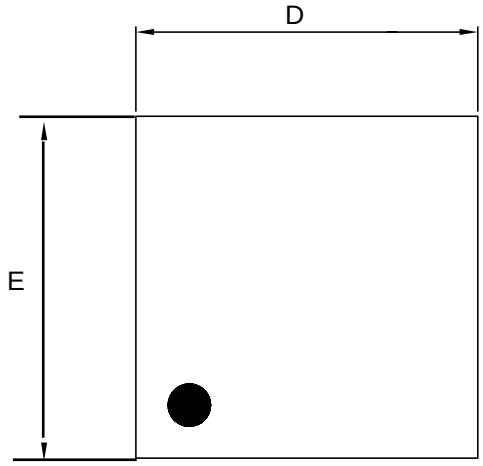
Gate charge Characteristics



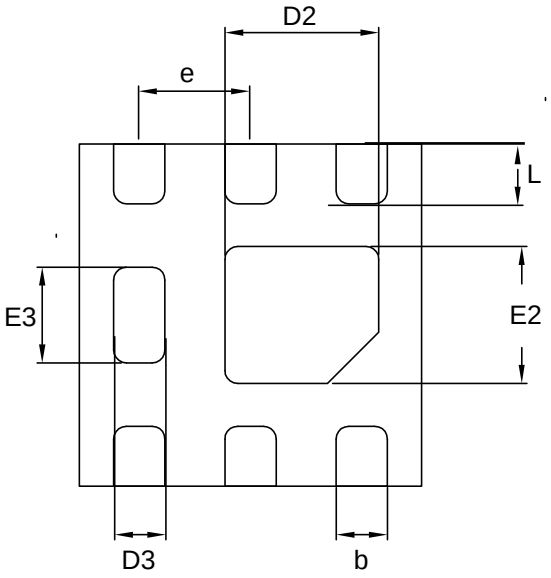
Transient thermal response (Junction-to-Ambient)

Package outline dimensions

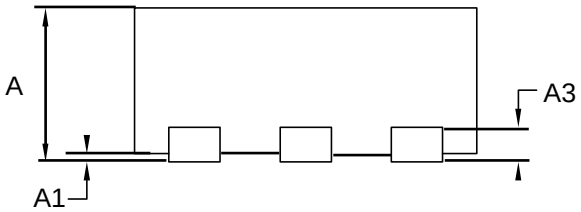
DFN2X2-6L



Top View



Bottom View



Side View

Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.70	0.75	0.80
A1	0.00	-	0.05
A3	0.203 Ref.		
D	1.95	2.00	2.05
E	1.95	2.00	2.05
D2	0.85	0.90	0.95
E2	0.75	0.80	0.85
D3	0.25	0.30	0.35
E3		0.56	
b	0.25	0.30	0.35
L	0.30	0.35	0.40
e	0.65 BSC.		