SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)

| PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-source breakdown voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	100	-	-	V
V_{DS} temperature coefficient	$\Delta V_{DS}/T_J$	I_D = 10 mA	-	81	-	mV/°C
$V_{GS(th)}$ temperature coefficient	$\Delta V_{GS(th)}/T_J$	I_D = 250 µA	-	-7.5	-	
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	2	-	4	V
Gate-source leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} = 100 V, V_{GS} = 0 V	-	-	1	µA
		V_{DS} = 100 V, V_{GS} = 0 V, T_J = 70 °C	-	-	15	
On-state drain current [a]	$I_{D(on)}$	$V_{DS} \geq$ 10 V, V_{GS} = 10 V	40	-	-	A
Drain-source on-state resistance [a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 10 A	-	0.0145	0.0174	Ω
		V_{GS} = 7.5 V, I_D = 10 A	-	0.0158	0.0205	
Forward transconductance [a]	g_{fs}	V_{DS} = 15 V, I_D = 10 A	-	46	-	S
Dynamic [b]						
Input capacitance	C_{iss}	V_{DS} = 50 V, V_{GS} = 0 V, f = 1 MHz	-	1470	-	pF
Output capacitance	C_{oss}		-	132	-	
Reverse transfer capacitance	C_{rss}		-	11.2	-	
Total gate charge	Q_g	V_{DS} = 50 V, V_{GS} = 10 V, I_D = 10 A	-	20	30	nC
			-	15.1	22.7	
Gate-source charge	Q_{gs}	V_{DS} = 50 V, V_{GS} = 7.5 V, I_D =10 A	-	6.45	-	
Gate-drain charge	Q_{gd}		-	3.5	-	
Output charge	Q_{oss}	V_{DS} = 50 V, V_{GS} = 0 V	-	22	-	
Gate resistance	R_g	f = 1 MHz	0.2	0.76	1.4	Ω
Turn-on delay time	$t_{d(on)}$	V_{DD} = 50 V, R_L = 5 Ω, $I_D \cong$ 10 A, V_{GEN} = 10 V, R_g = 1 Ω	-	12	24	ns
Rise time	t_r		-	5	10	
Turn-off delay time	$t_{d(off)}$		-	19	38	
Fall time	t_f		-	5	10	
Turn-on delay time	$t_{d(on)}$	V_{DD} = 50 V, R_L = 5 Ω, $I_D \cong$ 10 A, V_{GEN} = 7.5 V, R_g = 1 Ω	-	15	30	
Rise time	t_r		-	6	12	
Turn-off delay time	$t_{d(off)}$		-	19	38	
Fall time	t_f		-	5	10	
Drain-Source Body Diode Characteristics						
Continuous source-drain diode current	I_S	T_C = 25 °C	-	-	47.2	A
Pulse diode forward current	I_{SM}		-	-	80	
Body diode voltage	V_{SD}	I_S = 5 A, V_{GS} = 0 V	-	0.78	1.1	V
Body diode reverse recovery time	t_{rr}	I_F = 10 A, di/dt = 100 A/µs, T_J = 25 °C	-	43	86	ns
Body diode reverse recovery charge	Q_{rr}		-	72	144	nC
Reverse recovery fall time	t_a		-	33	-	ns
Reverse recovery rise time	t_b		-	10	-	

Notes

a. Pulse test; pulse width $\leq$ 300 µs, duty cycle $\leq$ 2 %
b. Guaranteed by design, not subject to production testing

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.
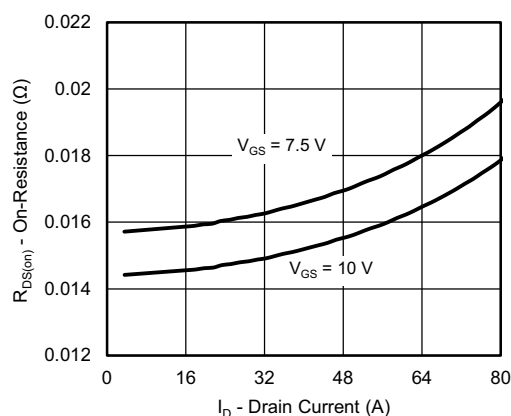
For technical questions, contact: pmostechsupport@vishay.com

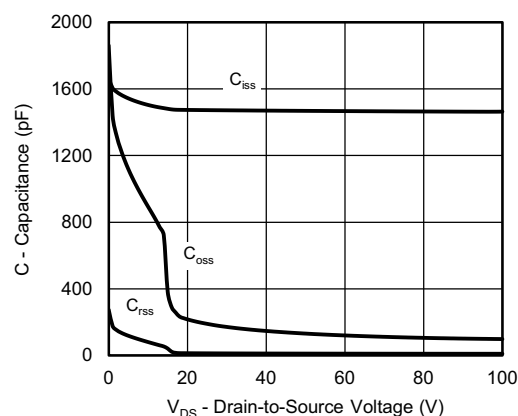## TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)
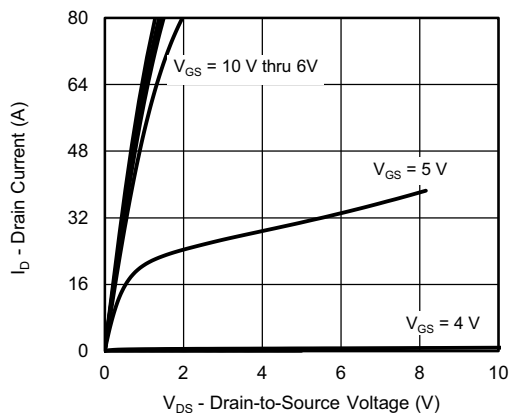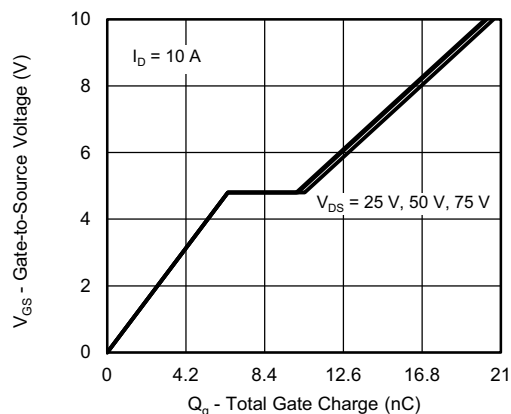

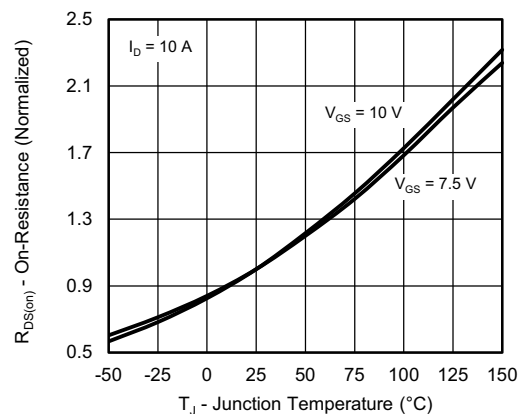**Output Characteristics**
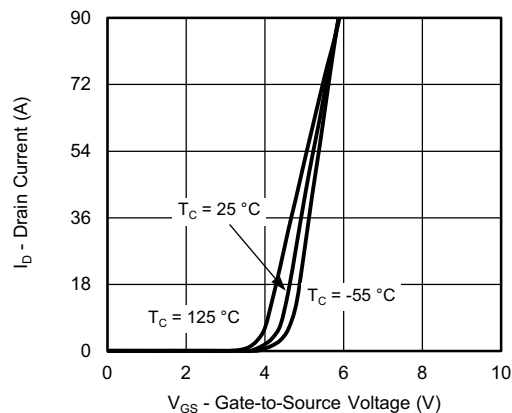
Transfer Characteristics

On-Resistance vs. Drain Current and Gate Voltage
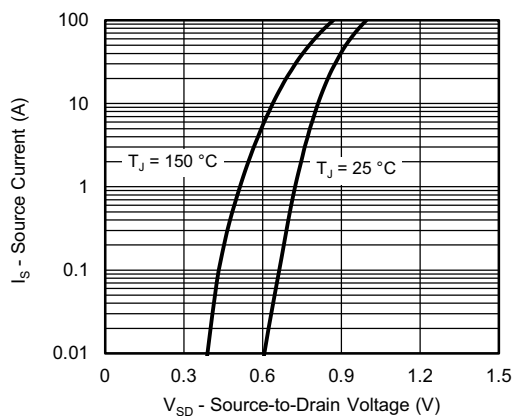

Capacitance
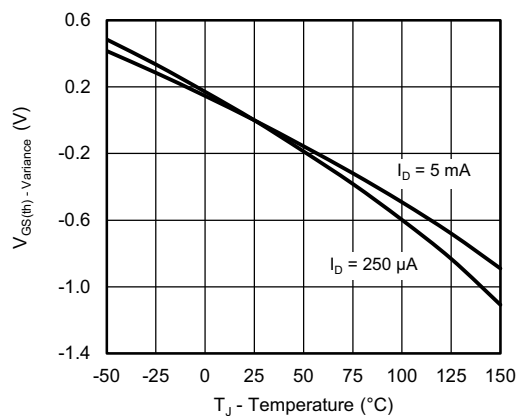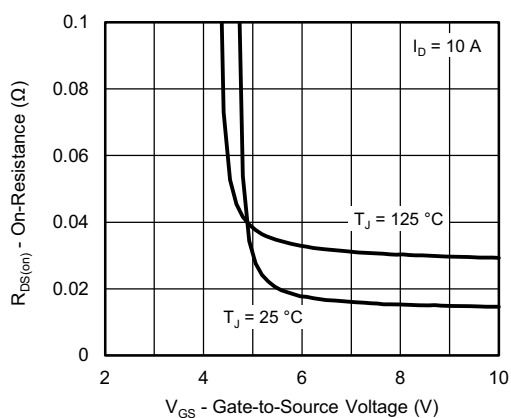

Gate Charge

On-Resistance vs. Junction Temperature

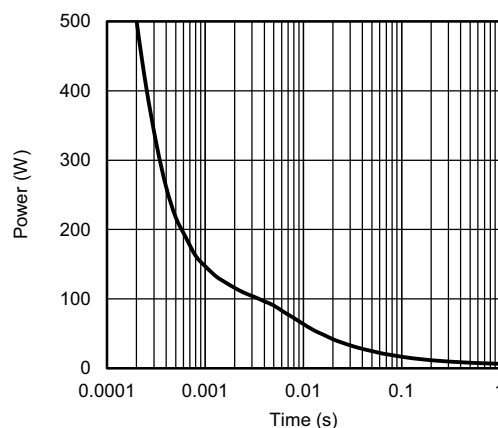## TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Source-Drain Diode Forward Voltage

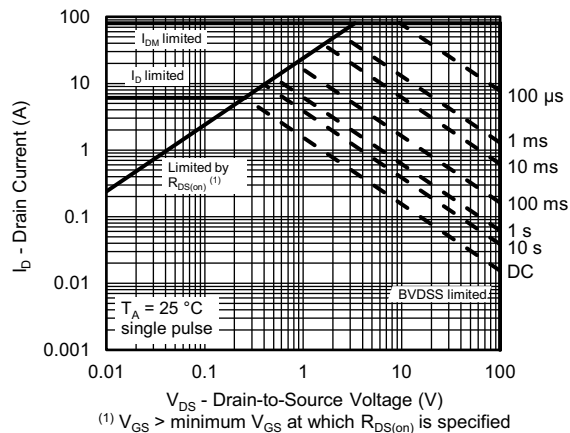X-axis: V_{SD} - Source-to-Drain Voltage (V)
Y-axis: I_S - Source Current (A)
Curves: $T_J = 150\ °C$, $T_J = 25\ °C$

Threshold Voltage

X-axis: T_J - Temperature (°C)
Y-axis: $V_{GS(th)}$ - Variance (V)
Curves: $I_D = 5\ mA$, $I_D = 250\ µA$

On-Resistance vs. Gate-to-Source Voltage

X-axis: V_{GS} - Gate-to-Source Voltage (V)
Y-axis: $R_{DS(on)}$ - On-Resistance (Ω)
$I_D = 10\ A$; $T_J = 125\ °C$; $T_J = 25\ °C$

Single Pulse Power, Junction-to-Ambient

X-axis: Time (s)
Y-axis: Power (W)

Safe Operating Area, Junction-to-Ambient

X-axis: V_{DS} - Drain-to-Source Voltage (V)
Y-axis: I_D - Drain Current (A)
I_{DM} limited; I_D limited; Limited by $R_{DS(on)}$ [1]; 100 µs; 1 ms; 10 ms; 100 ms; 1 s; 10 s; DC; BVDSS limited; $T_A = 25\ °C$ single pulse
[1] V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)
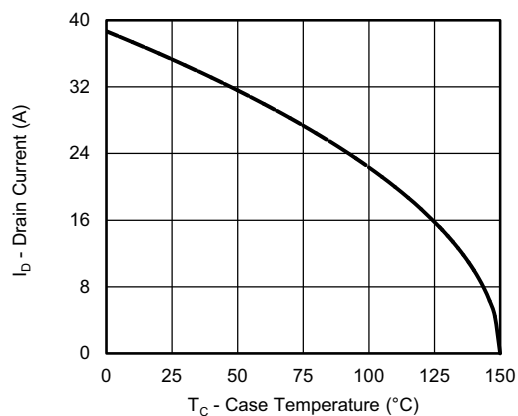
Current Derating [a]
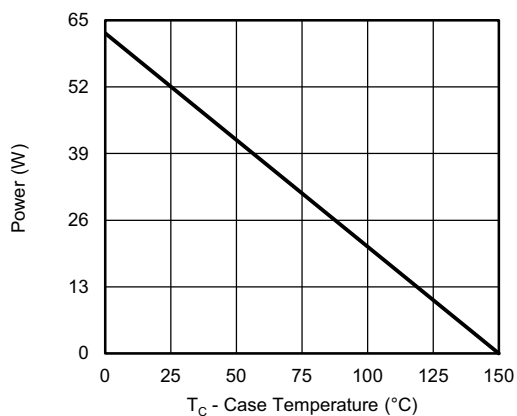
Power, Junction-to-Case
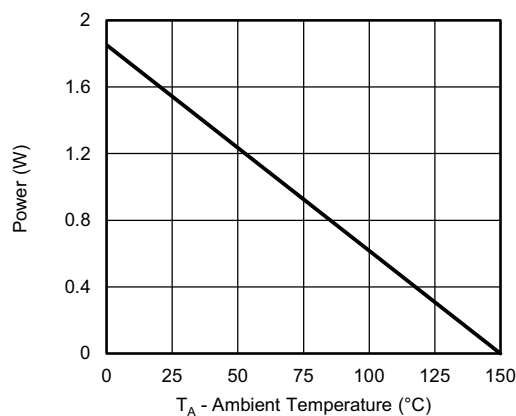
Power, Junction-to-Ambient

Note

a. The power dissipation P_D is based on T_J max. = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit

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TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Notes:

1. Duty cycle, $D = \frac{t_1}{t_2}$
2. Per unit base = R_{thJA} = 81 °C/W
3. $T_{JM} - T_A = P_{DM}Z_{thJA}{}^{(t)}$
4. Surface mounted
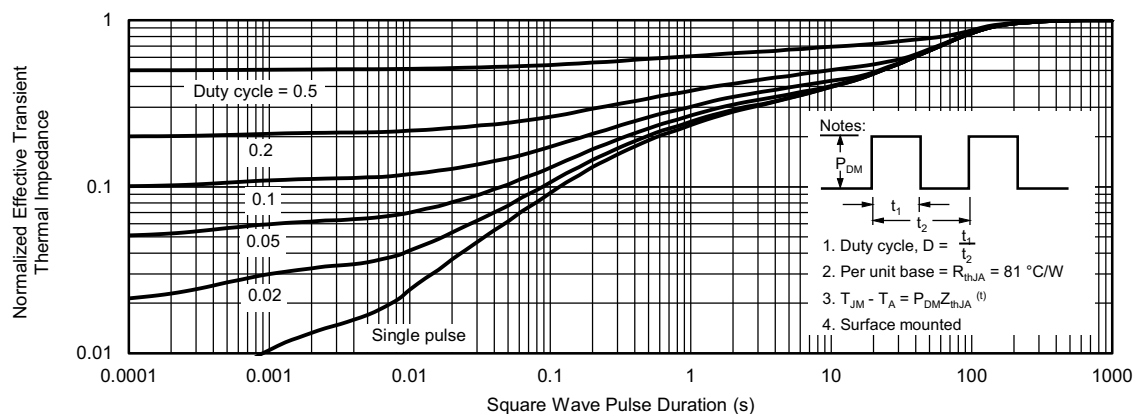
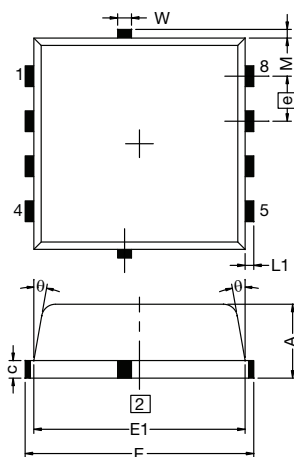Normalized Thermal Transient Impedance, Junction-to-Ambient
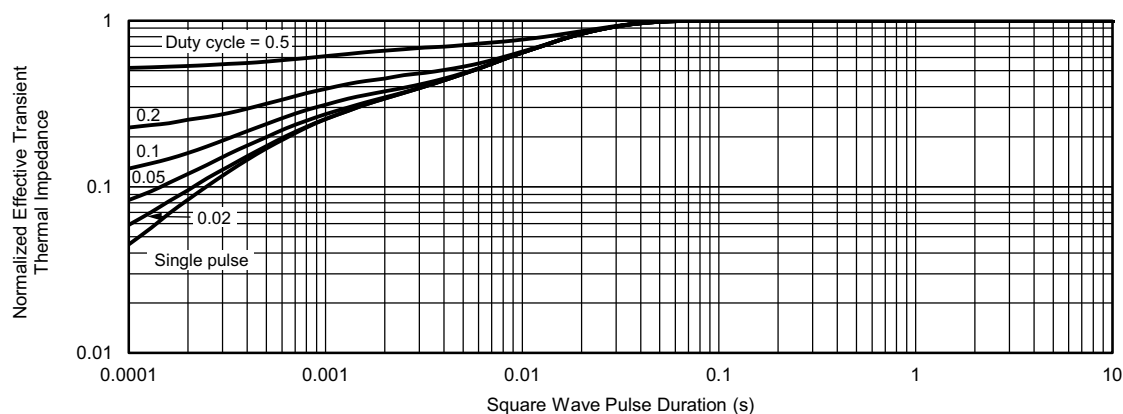
Normalized Thermal Transient Impedance, Junction-to-Case

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PowerPAK® 1212-8, (Single / Dual)

Notes
1. Inch will govern
2. Dimensions exclusive of mold gate burrs
3. Dimensions exclusive of mold flash and cutting burrs

Detail Z

Backside view of single pad
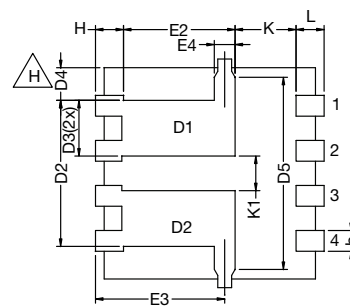
Backside view of dual pad

DIM.	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.97	1.04	1.12	0.038	0.041	0.044
A1	0.00	-	0.05	0.000	-	0.002
b	0.23	0.30	0.41	0.009	0.012	0.016
c	0.23	0.28	0.33	0.009	0.011	0.013
D	3.20	3.30	3.40	0.126	0.130	0.134
D1	2.95	3.05	3.15	0.116	0.120	0.124
D2	1.98	2.11	2.24	0.078	0.083	0.088
D3	0.48	-	0.89	0.019	-	0.035
D4	0.47 typ.			0.0185 typ		
D5	2.3 typ.			0.090 typ		
E	3.20	3.30	3.40	0.126	0.130	0.134
E1	2.95	3.05	3.15	0.116	0.120	0.124
E2	1.47	1.60	1.73	0.058	0.063	0.068
E3	1.75	1.85	1.98	0.069	0.073	0.078
E4	0.034 typ.			0.013 typ.		
e	0.65 BSC			0.026 BSC		
K	0.86 typ.			0.034 typ.		
K1	0.35	-	-	0.014	-	-
H	0.30	0.41	0.51	0.012	0.016	0.020
L	0.30	0.43	0.56	0.012	0.017	0.022
L1	0.06	0.13	0.20	0.002	0.005	0.008
θ	0°	-	12°	0°	-	12°
W	0.15	0.25	0.36	0.006	0.010	0.014
M	0.125 typ.			0.005 typ.		

ECN: S16-2667-Rev. M, 09-Jan-17
DWG: 5882

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