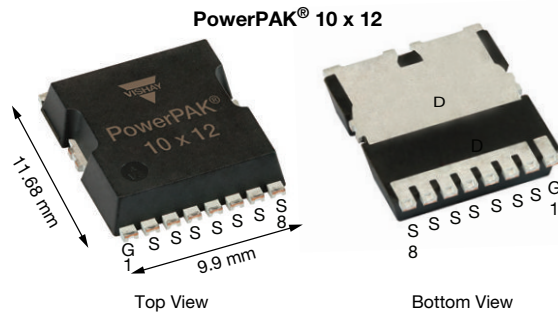


N-Channel 150 V (D-S) 175°C MOSFET



FEATURES

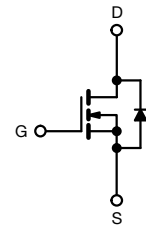
- TrenchFET® Gen V power MOSFET
- Leadership $R_{DS(on)}$ minimizes power loss from conduction
- 100 % R_g and UIS tested
- Standard level FET
- Enhance power dissipation and lower R_{thJC}
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Synchronous rectification
- DC-DC converter
- OR-ing and hot swap switch
- Power supplies
- Motor drive control
- Battery management



N-Channel MOSFET

PRODUCT SUMMARY	
V_{DS} (V)	150
$R_{DS(on)}$ max. (Ω) at $V_{GS} = 10$ V	0.0028
$R_{DS(on)}$ max. (Ω) at $V_{GS} = 7.5$ V	0.0035
Q_g typ. (nC) at $V_{GS} = 10$ V	130
I_D (A) ^a	294
Configuration	Single

ORDERING INFORMATION	
Package	PowerPAK® 10 x 12
Lead (Pb)-free and halogen-free	SiJK5716E-T1-GE3

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)				
PARAMETER	SYMBOL	LIMIT	UNIT	
Drain-source voltage	V_{DS}	150	V	
Gate-source voltage	V_{GS}	± 20		
Continuous drain current ($T_J = 175$ °C)	$T_C = 25$ °C	294	A	
	$T_C = 100$ °C	208		
	$T_A = 25$ °C	52 ^{b, c}		
	$T_A = 100$ °C	36 ^{b, c}		
Pulsed drain current ($t = 100$ μ s)	I_{DM}	500	A	
Continuous source-drain diode current	$T_C = 25$ °C	487		
	$T_A = 25$ °C	15 ^{b, c}		
Single pulse avalanche current	I_{AS}	90	mJ	
Single pulse avalanche energy	E_{AS}	405		
Maximum power dissipation	$T_C = 25$ °C	536	W	
	$T_C = 100$ °C	268		
	$T_A = 25$ °C	17 ^{b, c}		
	$T_A = 100$ °C	8.3 ^{b, c}		
Operating junction and storage temperature range	T_J, T_{stg}	-55 to +175	°C	
Soldering recommendations (peak temperature) ^c		260		

THERMAL RESISTANCE RATINGS					
PARAMETER	SYMBOL	TYPICAL	MAXIMUM	UNIT	
Maximum junction-to-ambient ^b	R_{thJA}	6.3	9	°C/W	
Maximum junction-to-case (drain)	R_{thJC}	0.21	0.28		

Notes

- $T_C = 25$ °C
- Surface mounted on 1" x 1" FR4 board
- $t = 10$ s
- See solder profile (www.vishay.com/doc?73257). The PowerPAK 10 x 12 is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection
- Rework conditions: manual soldering with a soldering iron is not recommended for leadless components
- Maximum under steady state conditions is 39 °C/W



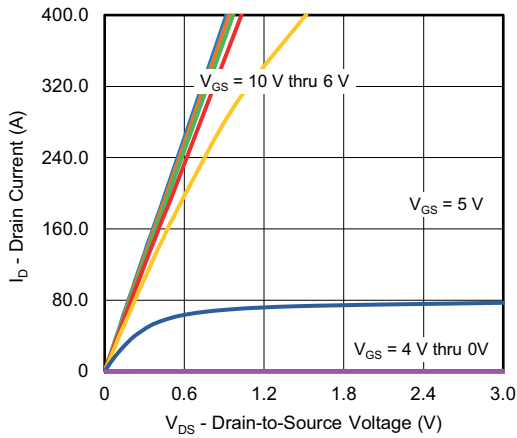
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-source breakdown voltage	V _{DS}	V _{GS} = 0 V, I _D = 1 mA	150	-	-	V
V _{DS} temperature coefficient	ΔV _{DS} /T _J	I _D = 10 mA	-	120	-	mV/°C
V _{GS(th)} temperature coefficient	ΔV _{GS(th)} /T _J	I _D = 250 μA	-	-7.6	-	
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2.0	-	4.0	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} = 120 V, V _{GS} = 0 V	-	-	1	μA
		V _{DS} = 120 V, V _{GS} = 0 V, T _J = 75 °C	-	-	15	
Drain-source on-state resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 20 A	-	0.0023	0.0028	Ω
		V _{DS} = 7.5 V, I _D = 20 A	-	0.0027	0.0035	
Forward transconductance ^a	g _{fs}	V _{DS} = 25 V, I _D = 20 A	-	88	-	S
Dynamic ^b						
Input capacitance	C _{iss}	V _{DS} = 75 V, V _{GS} = 0 V, f = 1 MHz	-	11 500	-	pF
Output capacitance	C _{oss}		-	950	-	
Reverse transfer capacitance	C _{rss}		-	5.5	-	
Total gate charge	Q _g	V _{DS} = 75 V, V _{GS} = 10 V, I _D = 20 A	-	130	195	nC
Gate-source charge	Q _{gs}		-	56	-	
Gate-drain charge	Q _{gd}		-	4	-	
Output charge	Q _{oss}		V _{DS} = 75 V, V _{GS} = 0 V	-	300	
Gate resistance	R _g	f = 1 MHz	0.5	1.2	2.0	Ω
Turn-on delay time	t _{d(on)}	V _{DD} = 75 V, R _L = 3.75 Ω, I _D ≅ 20 A, V _{GEN} = 10 V, R _g = 1 Ω	-	30	60	ns
Rise time	t _r		-	22	44	
Turn-off delay time	t _{d(off)}		-	52	104	
Fall time	t _f		-	20	40	
Drain-Source Body Diode Characteristics						
Continuous source-drain diode current	I _S	T _C = 25 °C	-	-	487	A
Pulse diode forward current	I _{SM}		-	-	500	
Body diode voltage	V _{SD}	I _S = 10 A, V _{GS} = 0 V	-	0.75	1.1	V
Body diode reverse recovery time	t _{rr}	I _F = 20 A, di/dt = 100 A/μs, T _J = 25 °C	-	120	240	ns
Body diode reverse recovery charge	Q _{rr}		-	580	1160	nC
Reverse recovery fall time	t _a		-	86	-	ns
Reverse recovery rise time	t _b		-	34	-	

Notes

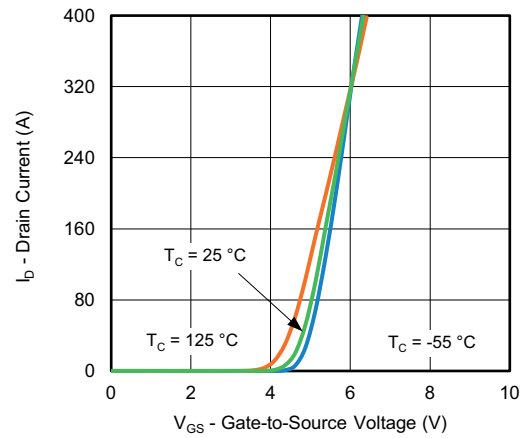
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %
- b. Guaranteed by design, not subject to production testing

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.

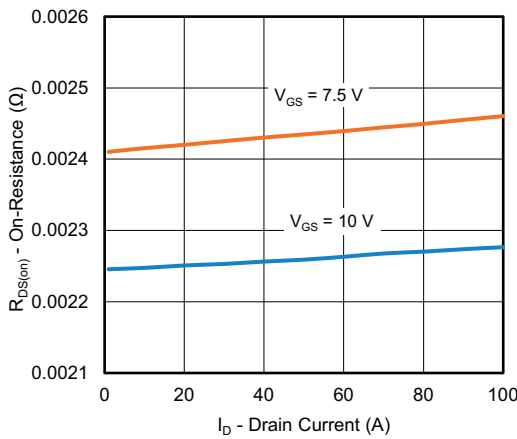
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



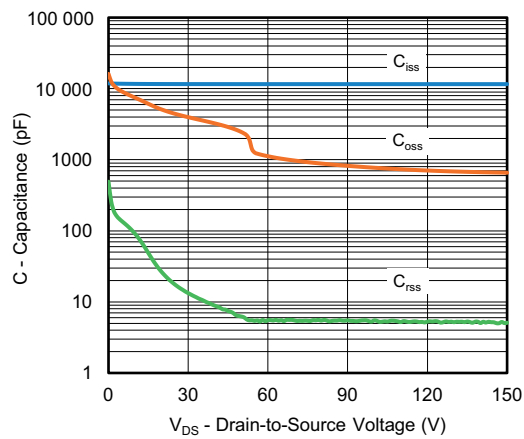
Output Characteristics



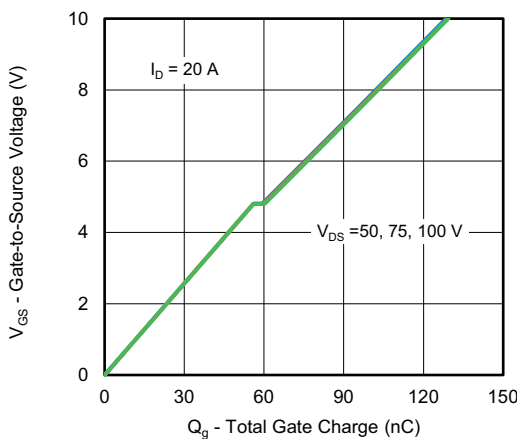
Transfer Characteristics



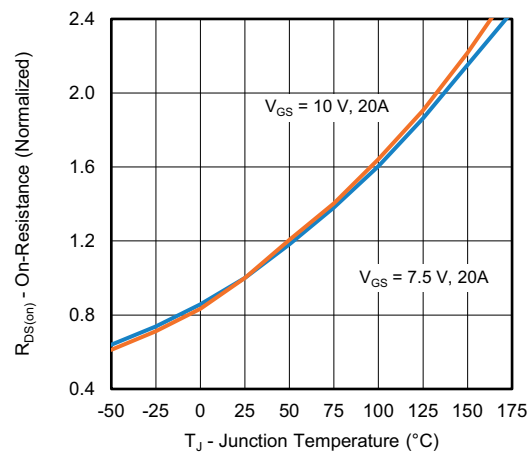
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

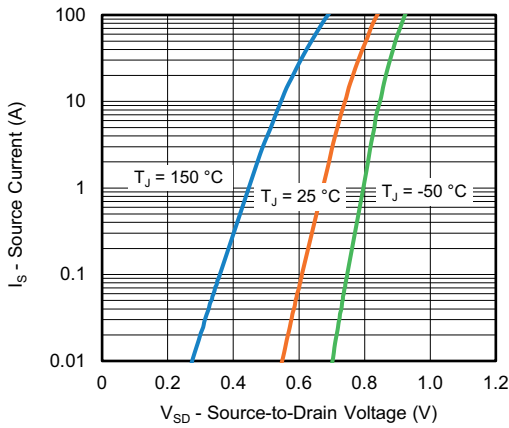


Gate Charge

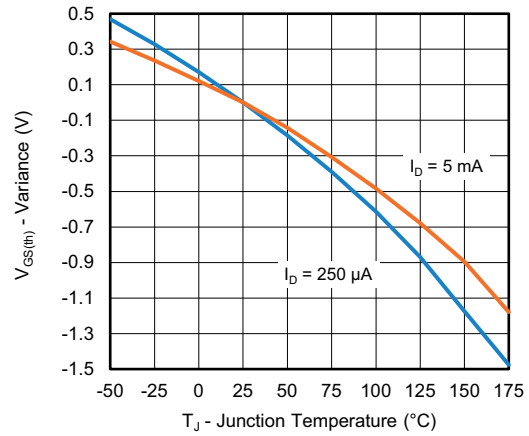


On-Resistance vs. Junction Temperature

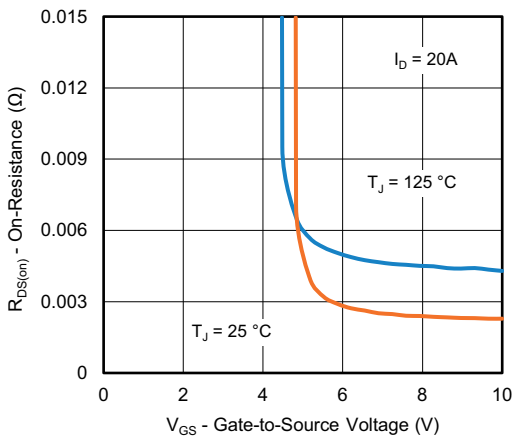
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



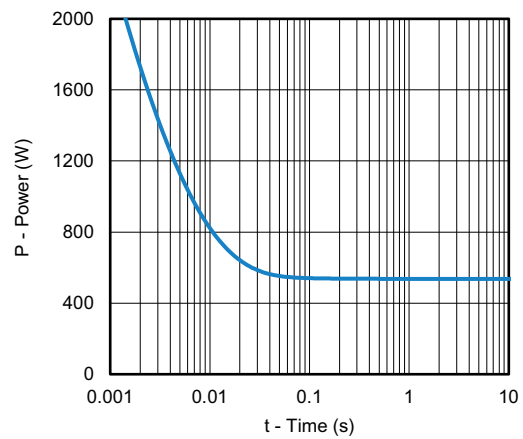
Source-Drain Diode Forward Voltage



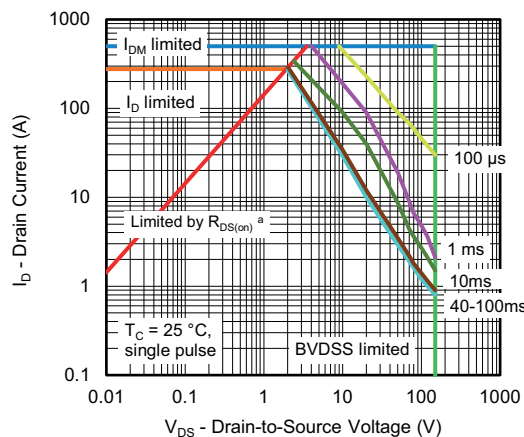
Threshold Voltage



On-Resistance vs. Gate-to-Source Voltage



Single Pulse Power, Junction-to-Case



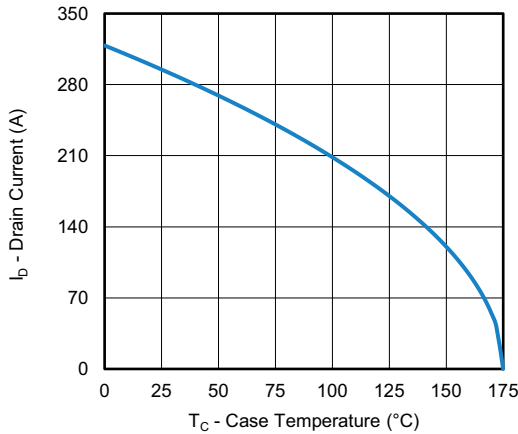
Safe Operating Area, Junction-to-Case

Note

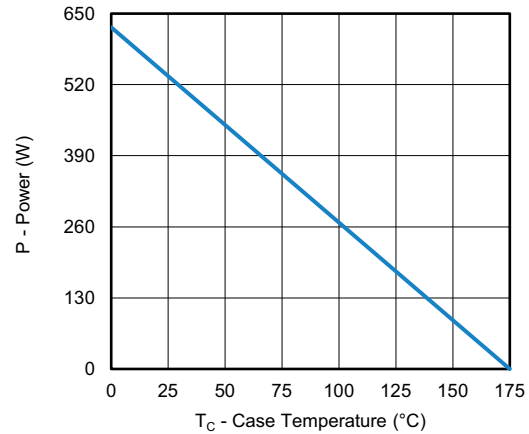
a. $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified



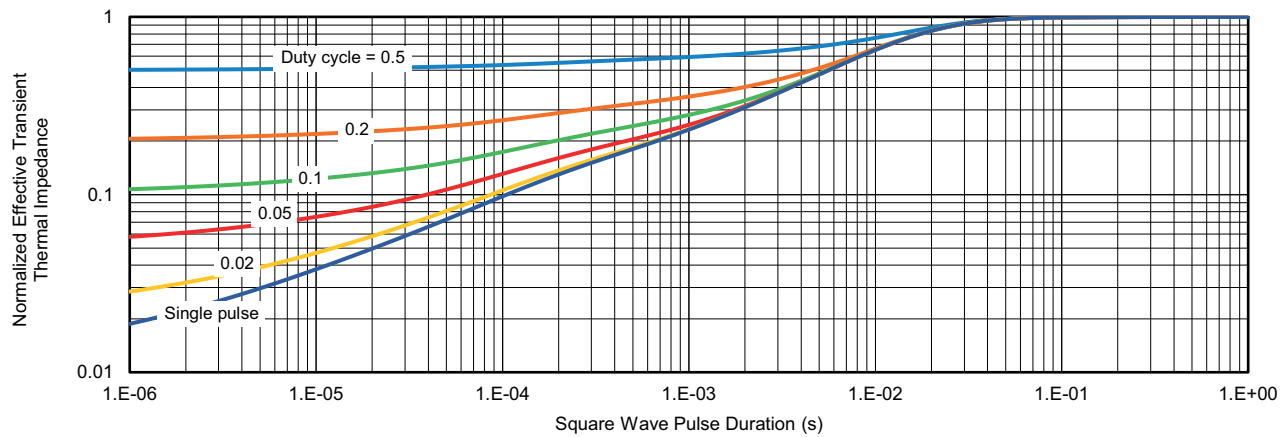
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Current Derating ^a



Power, Junction-to-Case



Normalized Thermal Transient Impedance, Junction-to-Case

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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