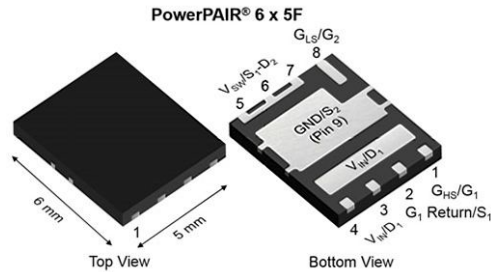


Dual N-Channel 30 V (D-S) MOSFET with Schottky Diode



FEATURES

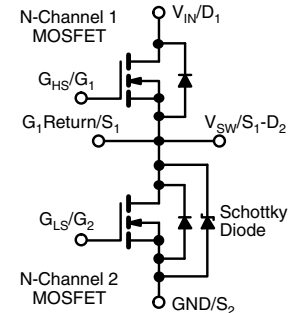
- TrenchFET® Gen IV power MOSFET
- SkyFET® low-side MOSFET with integrated Schottky
- 100 % R_g and UIS tested
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- CPU core power
- Computer / server peripherals
- POL
- Synchronous buck converter
- Telecom DC/DC



PRODUCT SUMMARY		
	CHANNEL-1	CHANNEL-2
V _{DS} (V)	30	30
R _{DS(on)} max. (Ω) at V _{GS} = 10 V	0.00307	0.00105
R _{DS(on)} max. (Ω) at V _{GS} = 4.5 V	0.00530	0.00145
Q _g typ. (nC)	9	38.6
I _D (A) ^a	76	197
Configuration	Dual	

ORDERING INFORMATION		
Package	PowerPAIR 6 x 5F	
Lead (Pb)-free and halogen-free	SiZF920DT-T1-GE3	

ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C, unless otherwise noted)					
PARAMETER	SYMBOL	CHANNEL-1	CHANNEL-2	UNIT	
Drain-source voltage	V _{DS}	30	30	V	
Gate-source voltage	V _{GS}	+20, -16	+16, -12		
Continuous drain current (T _J = 150 °C)	I _D	T _C = 25 °C	76	197	A
		T _C = 70 °C	61	158	
		T _A = 25 °C	28 ^{b, c}	49 ^{b, c}	
		T _A = 70 °C	23 ^{b, c}	39 ^{b, c}	
Pulsed drain current (t = 100 μs)	I _{DM}	130	130	A	
Continuous source-drain diode current	I _S	T _C = 25 °C	26	122	A
		T _A = 25 °C	3.6 ^{b, c}	7.4 ^{b, c}	
Single pulse avalanche current	I _{AS}	16	28	mJ	
Single pulse avalanche energy	E _{AS}	13	39		
Maximum power dissipation	P _D	T _C = 25 °C	28	74	W
		T _C = 70 °C	18	47	
		T _A = 25 °C	3.9 ^{b, c}	4.5 ^{b, c}	
		T _A = 70 °C	2.5 ^{b, c}	2.9 ^{b, c}	
Operating junction and storage temperature range	T _J , T _{stg}	-55 to +150		°C	
Soldering recommendations (peak temperature) ^{d, e}		260			

THERMAL RESISTANCE RATINGS							
PARAMETER	SYMBOL	CHANNEL-1		CHANNEL-2		UNIT	
		TYP.	MAX.	TYP.	MAX.		
Maximum junction-to-ambient ^{b, f}	t ≤ 10 s	R _{thJA}	25	32	22	28	°C/W
Maximum junction-to-case (source)	Steady state	R _{thJC}	3.5	4.4	1.3	1.7	

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 PowerPAIR 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 65 °C/W for channel-1 and 65 °C/W for channel-2



SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
Static							
Drain-source breakdown voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	Ch-1	30	-	-	V
			Ch-2	30	-	-	
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	Ch-1	1.1	-	2.4	V
			Ch-2	1.1	-	2.2	
Gate-source leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = +20\text{ V}, -16\text{ V}$	Ch-1	-	-	± 100	nA
		$V_{DS} = 0\text{ V}, V_{GS} = +16\text{ V}, -12\text{ V}$	Ch-2	-	-	± 100	
Zero Gate voltage drain current	I_{DSS}	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$	Ch-1	-	-	1	μA
			Ch-2	-	60	400	
		$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$	Ch-1	-	-	5	
			Ch-2	-	350	4000	
On-state drain current ^b	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	Ch-1	20	-	-	A
			Ch-2	20	-	-	
Drain-source on-state resistance ^b	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 10\text{ A}$	Ch-1	-	0.00230	0.00307	Ω
		$V_{GS} = 10\text{ V}, I_D = 10\text{ A}$	Ch-2	-	0.00070	0.00105	
		$V_{GS} = 4.5\text{ V}, I_D = 5\text{ A}$	Ch-1	-	0.00380	0.00530	
		$V_{GS} = 4.5\text{ V}, I_D = 5\text{ A}$	Ch-2	-	0.00095	0.00145	
Forward transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 25\text{ A}$	Ch-1	-	65	-	S
		$V_{DS} = 15\text{ V}, I_D = 25\text{ A}$	Ch-2	-	135	-	
Dynamic ^a							
Input capacitance	C_{iss}	Channel-1 $V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$ Channel-2 $V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$	Ch-1	-	1300	-	pF
			Ch-2	-	5230	-	
Output capacitance	C_{oss}		Ch-1	-	700	-	
			Ch-2	-	2920	-	
Reverse transfer capacitance	C_{rss}		Ch-1	-	35	-	
			Ch-2	-	360	-	
C_{rss}/C_{iss} ratio			Ch-1	-	0.027	0.054	
			Ch-2	-	0.069	0.140	
Total gate charge	Q_g	$V_{DS} = 15\text{ V}, V_{GS} = 10\text{ V}, I_D = 10\text{ A}$	Ch-1	-	19	29	nC
		$V_{DS} = 15\text{ V}, V_{GS} = 10\text{ V}, I_D = 10\text{ A}$	Ch-2	-	83	125	
		$V_{DS} = 15\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$	Ch-1	-	9	14	
		$V_{DS} = 15\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$	Ch-2	-	38.6	58	
Gate-source charge	Q_{gs}	Channel-1 $V_{DS} = 15\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$	Ch-1	-	4.4	-	
			Ch-2	-	17	-	
Gate-drain charge	Q_{gd}	Channel-2 $V_{DS} = 15\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$	Ch-1	-	2	-	
			Ch-2	-	9.2	-	
Output charge	Q_{oss}	$V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}$	Ch-1	-	17	-	
			Ch-2	-	46	-	
Gate resistance	R_g	$f = 1\text{ MHz}$	Ch-1	0.2	1	2	Ω
			Ch-2	0.1	0.4	0.8	



SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
Dynamic ^a							
Turn-on delay time	$t_{d(on)}$	Channel-1 $V_{DD} = 15\text{ V}$, $R_L = 1.5\ \Omega$ $I_D \cong 10\text{ A}$, $V_{GEN} = 4.5\text{ V}$, $R_g = 1\ \Omega$	Ch-1	-	18	35	ns
Rise time	t_r		Ch-2	-	34	70	
Turn-off delay time	$t_{d(off)}$	Channel-2 $V_{DD} = 15\text{ V}$, $R_L = 3\ \Omega$ $I_D \cong 5\text{ A}$, $V_{GEN} = 4.5\text{ V}$, $R_g = 1\ \Omega$	Ch-1	-	95	190	
			Ch-2	-	116	230	
Fall time	t_f	Channel-1	Ch-1	-	17	35	
			Ch-2	-	45	90	
Turn-on delay time	$t_{d(on)}$	Channel-2 $V_{DD} = 15\text{ V}$, $R_L = 3\ \Omega$ $I_D \cong 5\text{ A}$, $V_{GEN} = 10\text{ V}$, $R_g = 1\ \Omega$	Ch-1	-	10	20	
			Ch-2	-	27	50	
Rise time	t_r	Channel-1	Ch-1	-	11	20	
			Ch-2	-	17	35	
Turn-off delay time	$t_{d(off)}$	Channel-2 $V_{DD} = 15\text{ V}$, $R_L = 3\ \Omega$ $I_D \cong 5\text{ A}$, $V_{GEN} = 10\text{ V}$, $R_g = 1\ \Omega$	Ch-1	-	5	10	
			Ch-2	-	70	150	
Fall time	t_f	Channel-1	Ch-1	-	20	40	
			Ch-2	-	43	85	
		Channel-2 $V_{DD} = 15\text{ V}$, $R_L = 3\ \Omega$ $I_D \cong 5\text{ A}$, $V_{GEN} = 10\text{ V}$, $R_g = 1\ \Omega$	Ch-1	-	5	10	
			Ch-2	-	10	20	
Drain-Source Body Diode Characteristics							
Continuous source-drain diode current	I_S	$T_C = 25\text{ }^\circ\text{C}$	Ch-1	-	-	26	A
			Ch-2	-	-	122	
Pulse diode forward current ^a	I_{SM}		Ch-1	-	-	130	
			Ch-2	-	-	130	
Body diode voltage	V_{SD}	$I_S = 10\text{ A}$, $V_{GS} = 0\text{ V}$	Ch-1	-	0.77	1.1	V
		$I_S = 3\text{ A}$, $V_{GS} = 0\text{ V}$	Ch-2	-	0.36	0.60	
Body diode reverse recovery time	t_{rr}	Channel-1 $I_F = 10\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$, $T_J = 25\text{ }^\circ\text{C}$	Ch-1	-	27	50	ns
			Ch-2	-	55	110	
Body diode reverse recovery charge	Q_{rr}	Channel-1	Ch-1	-	15	30	nC
			Ch-2	-	66	130	
Reverse recovery fall time	t_a	Channel-2 $I_F = 10\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$, $T_J = 25\text{ }^\circ\text{C}$	Ch-1	-	16	-	ns
			Ch-2	-	30	-	
Reverse recovery rise time	t_b	Channel-2	Ch-1	-	11	-	
			Ch-2	-	25	-	

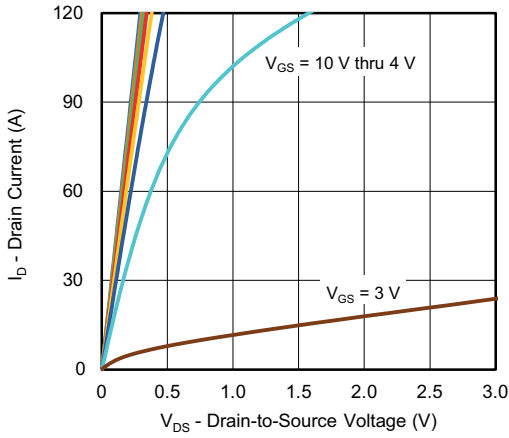
Notes

- a. Guaranteed by design, not subject to production testing
- b. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$

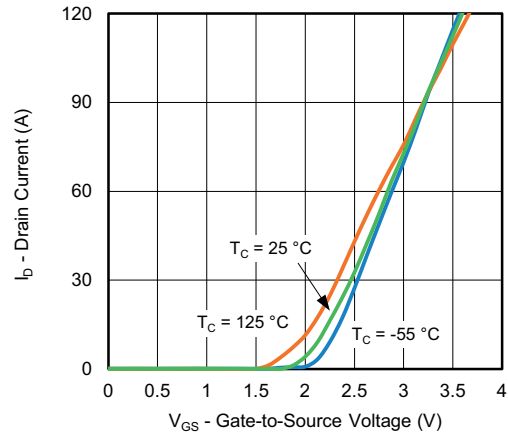
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



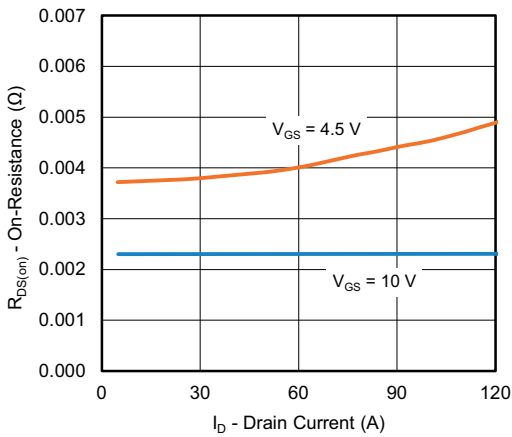
CHANNEL-1 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



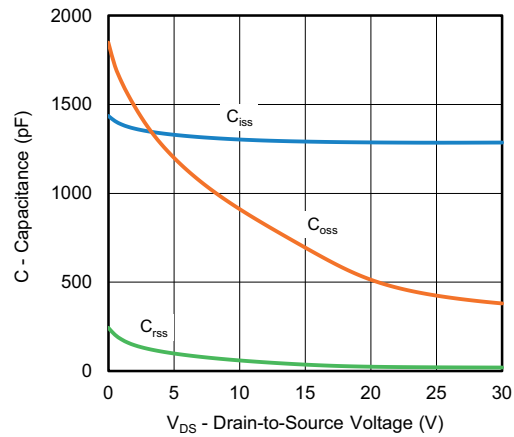
Output Characteristics



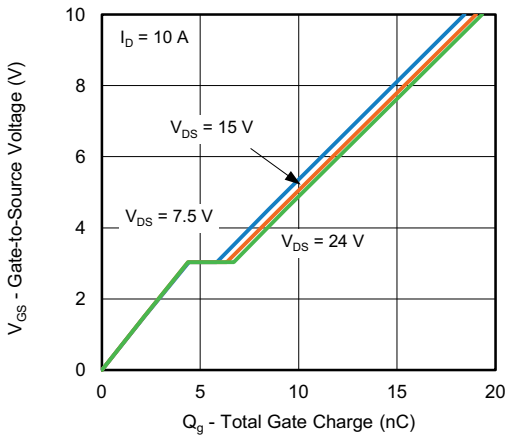
Transfer Characteristics



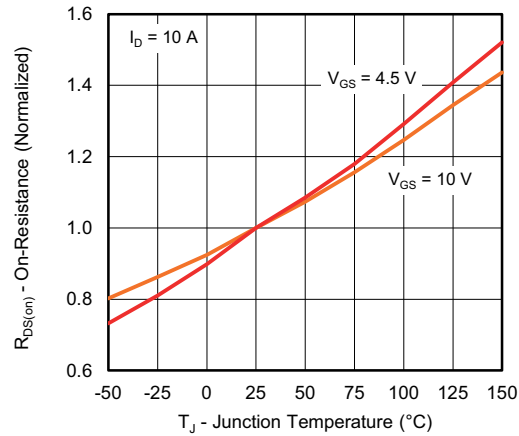
On-Resistance vs. Drain Current



Capacitance



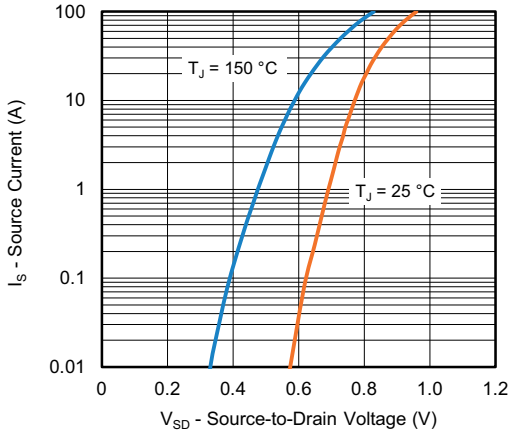
Gate Charge



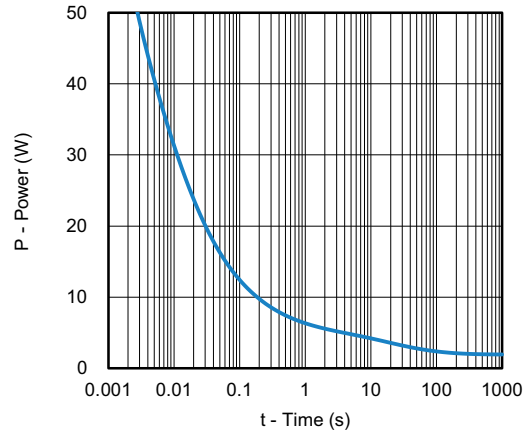
On-Resistance vs. Junction Temperature



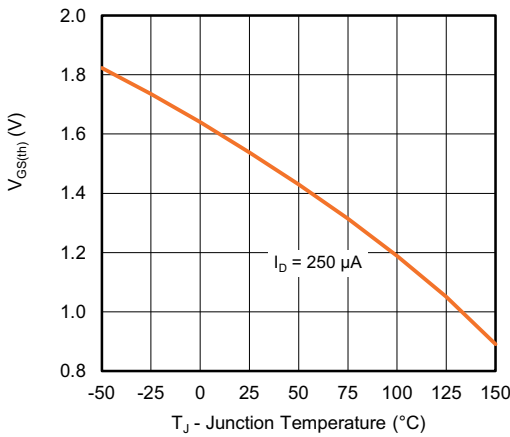
CHANNEL-1 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



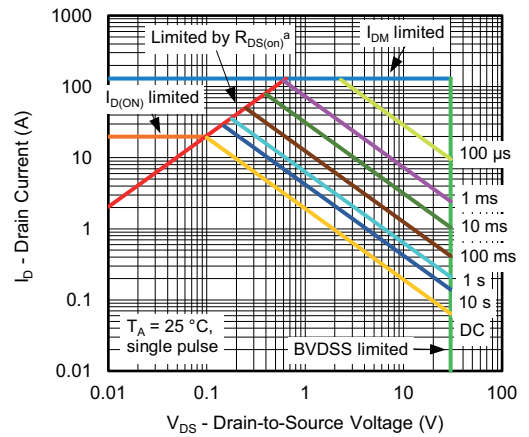
Source-Drain Diode Forward Voltage



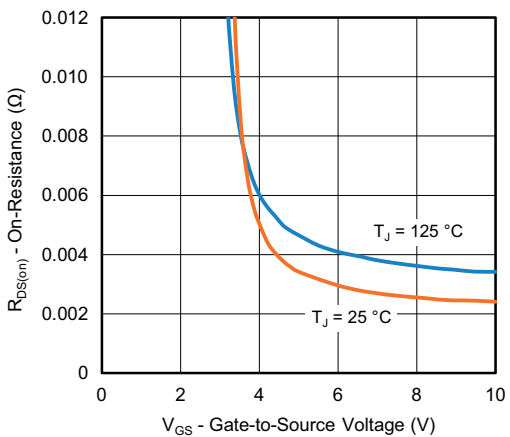
Single Pulse Power, Junction-to-Ambient



Threshold Voltage



Safe Operating Area, Junction-to-Ambient



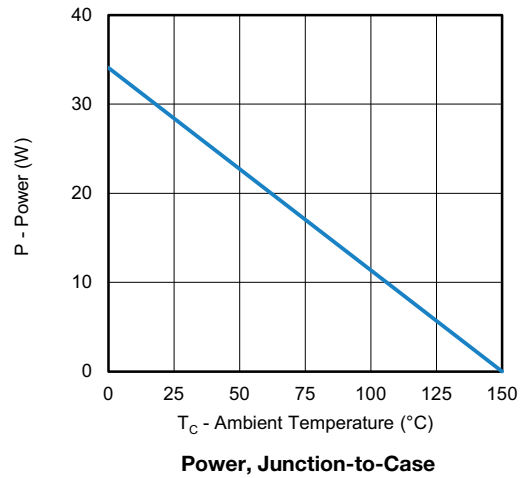
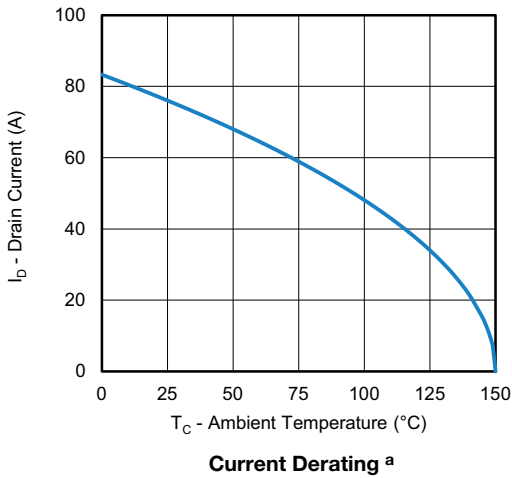
On-Resistance vs. Gate-to-Source Voltage

Note

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



CHANNEL-1 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

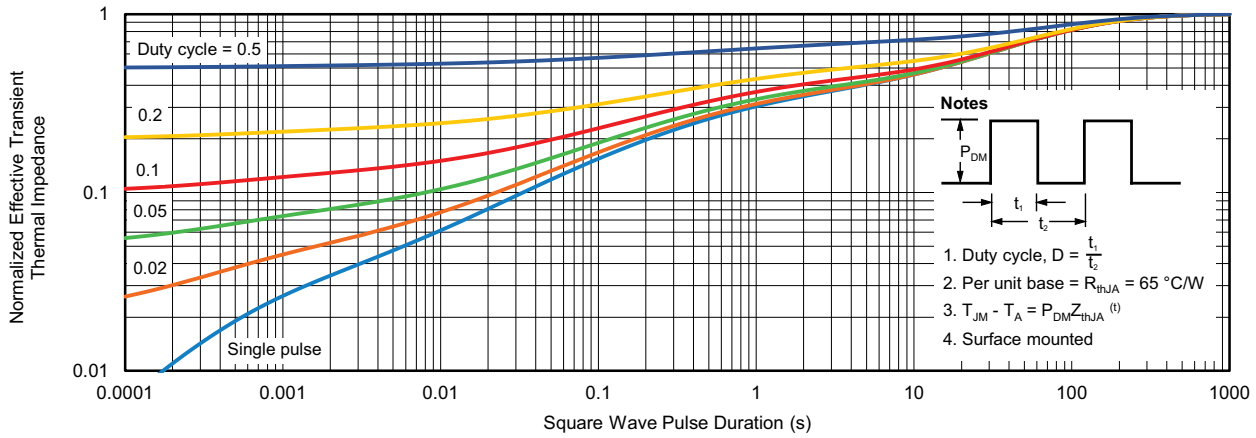


Note

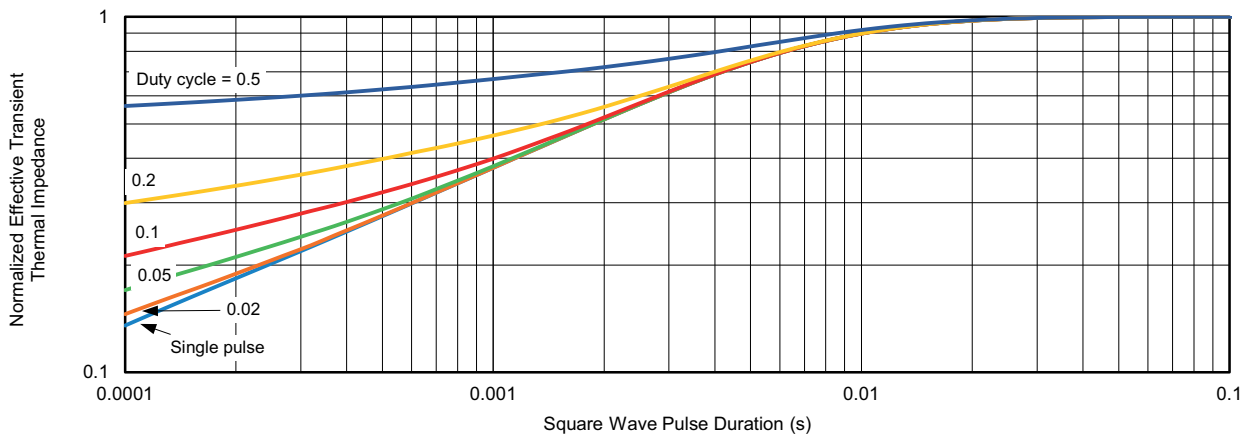
- a. The power dissipation P_D is based on T_J max. = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit



CHANNEL-1 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

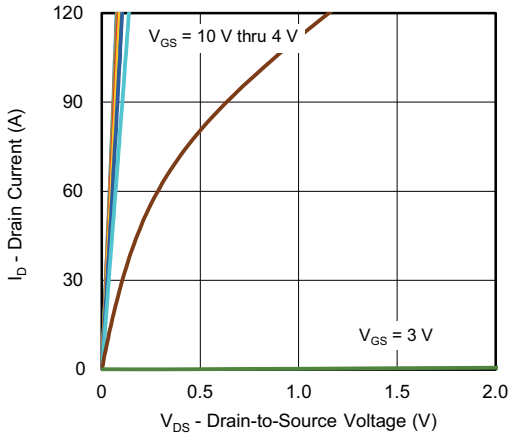


Normalized Thermal Transient Impedance, Junction-to-Ambient

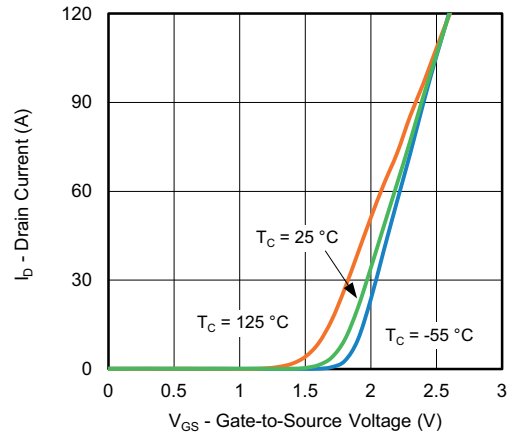


Normalized Thermal Transient Impedance, Junction-to-Case

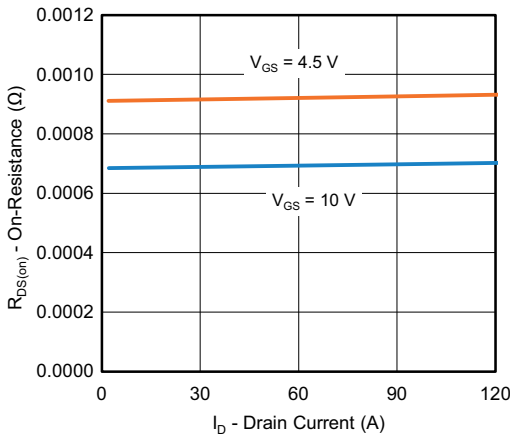
CHANNEL-2 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



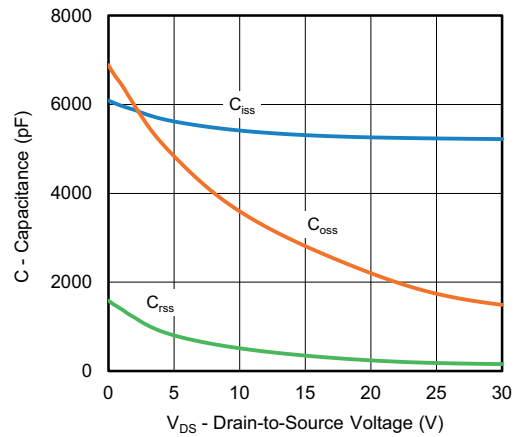
Output Characteristics



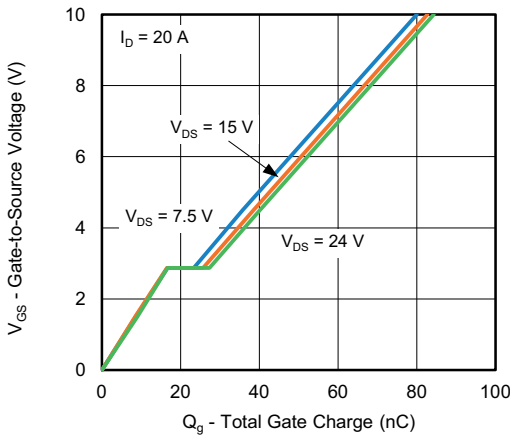
Transfer Characteristics



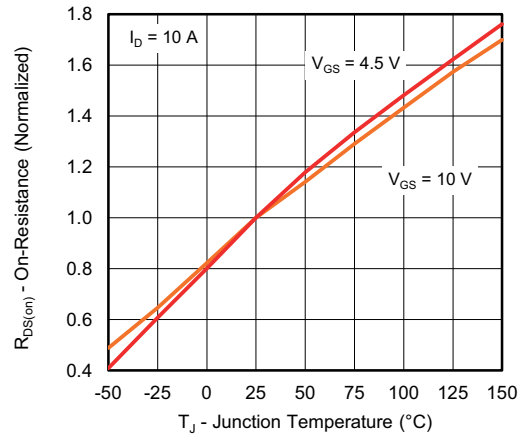
On-Resistance vs. Drain Current



Capacitance



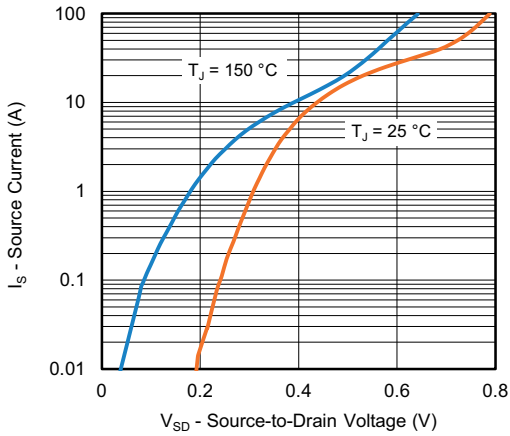
Gate Charge



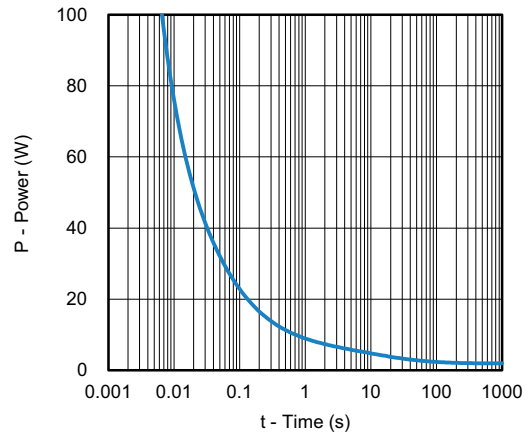
On-Resistance vs. Junction Temperature



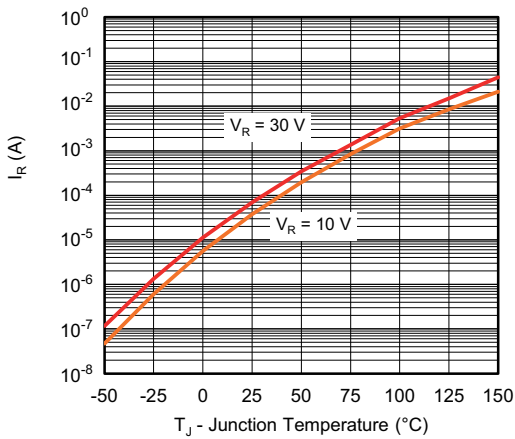
CHANNEL-2 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



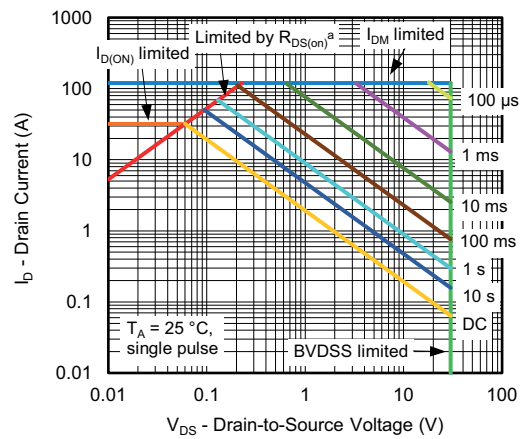
Source-Drain Diode Forward Voltage



Single Pulse Power, Junction-to-Ambient



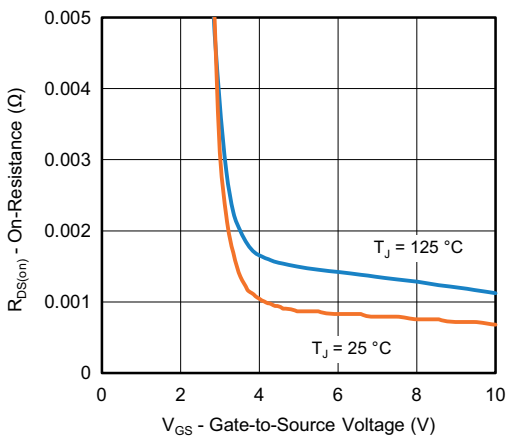
Reverse Current (Schottky)



Safe Operating Area, Junction-to-Ambient

Note

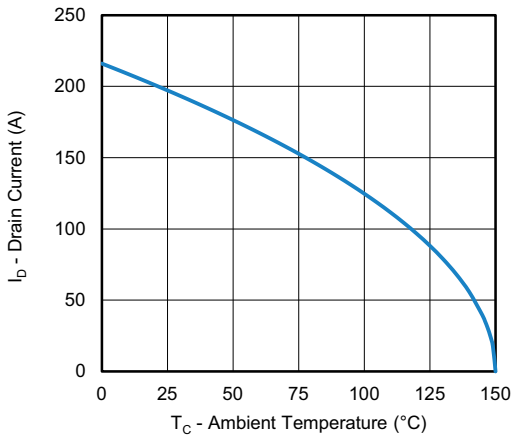
a. $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified



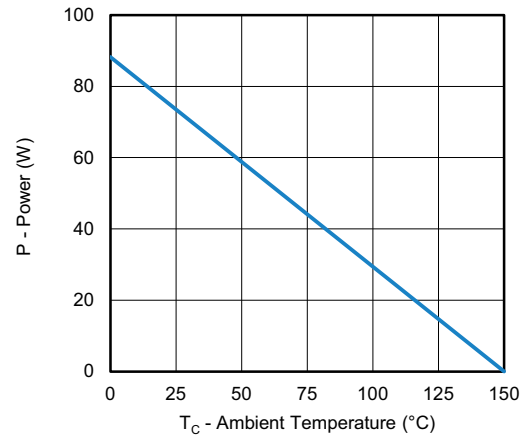
On-Resistance vs. Gate-to-Source Voltage



CHANNEL-2 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Current Derating ^a



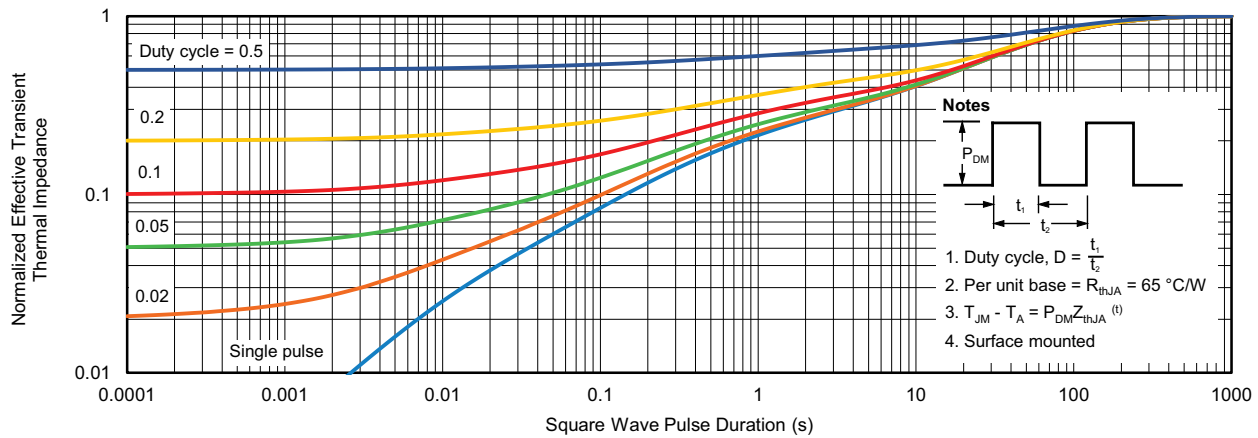
Power, Junction-to-Case

Note

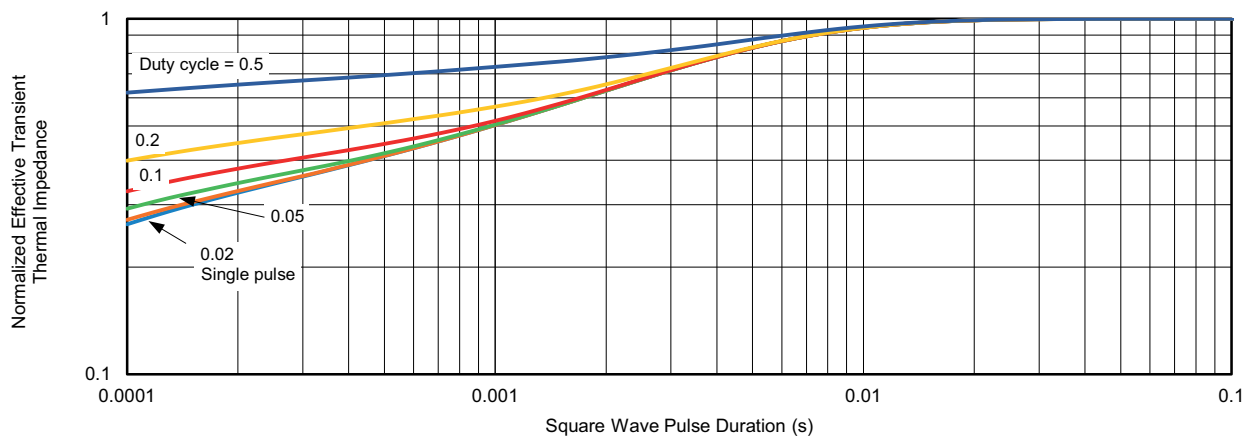
- a. The power dissipation P_D is based on T_J max. = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit



CHANNEL-2 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
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- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.