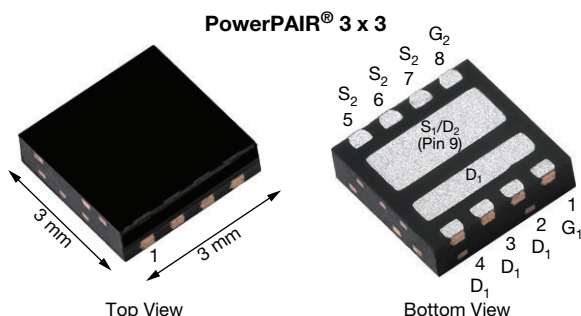


Dual N-Channel 30 V (D-S) MOSFET



FEATURES

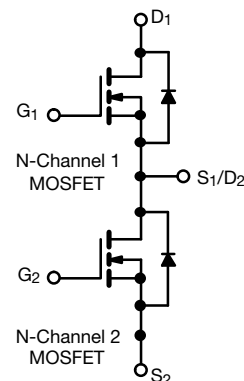
- TrenchFET® Gen IV power MOSFET
- High side and low side MOSFETs form optimized combination for 50 % duty cycle
- Optimized $R_{DS(on)}$ - Q_g and $R_{DS(on)}$ - Q_{gd} FOM elevates efficiency for high frequency switching
- 100 % R_g and UIS tested
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Synchronous buck
- DC/DC conversion
- Half bridge
- POL



PRODUCT SUMMARY

V_{DS} (V)	30
$R_{DS(on)}$ max. (Ω) at $V_{GS} = 10$ V	0.0092
$R_{DS(on)}$ max. (Ω) at $V_{GS} = 4.5$ V	0.0155
Q_g typ. (nC)	3.7
I_D (A)	33.6 ^a
Configuration	Dual

ORDERING INFORMATION

Package	PowerPAIR 3 x 3
Lead (Pb)-free and halogen-free	SiZ342DDT-T1-GE3

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-source voltage	V_{DS}	30	V
Gate-source voltage	V_{GS}	+20 / -16	
Continuous drain current ($T_J = 150$ °C)	I_D	33.6	A
		26.9	
		15.8 ^{b, c}	
		12.6 ^{b, c}	
Pulsed drain current ($t = 100$ μ s)	I_{DM}	100	A
Continuous source current (MOSFET diode conduction)	I_S	13.9	
		3.1 ^{b, c}	
Single pulse avalanche current	I_{AS}	10	
Single pulse avalanche energy	E_{AS}	5	mJ
Maximum power dissipation	P_D	16.7	W
		10.7	
		3.7 ^{b, c}	
		2.4 ^{b, c}	
Operating junction and storage temperature range	T_J, T_{stg}	-55 to +150	°C
Soldering recommendations (peak temperature)		260	

Notes

- a. $T_C = 25$ °C
b. Surface mounted on 1" x 1" FR4 board
c. $t = 10$ s

**THERMAL RESISTANCE RATINGS**

PARAMETER		SYMBOL	TYPICAL	MAXIMUM	UNIT
Maximum junction-to-ambient ^{a, b}	$t \leq 10$ s	R_{thJA}	27	34	°C/W
Maximum junction-to-case (drain)	Steady state	R_{thJC}	6	7.5	

Notes

a. Surface mounted on 1" x 1" FR4 board

b. Maximum under steady state conditions is 69 °C/W

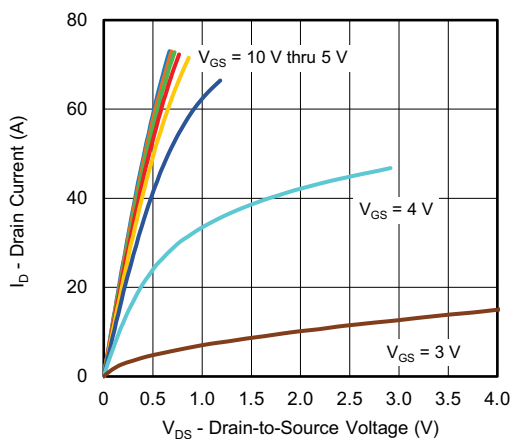
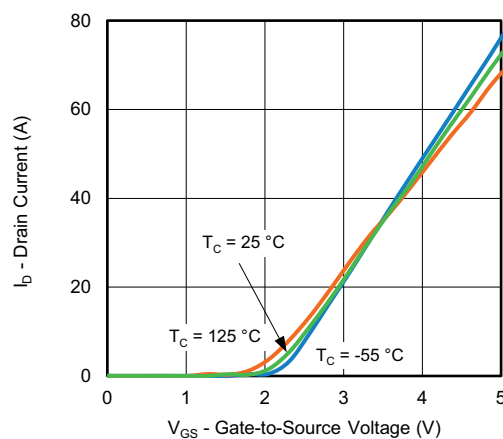
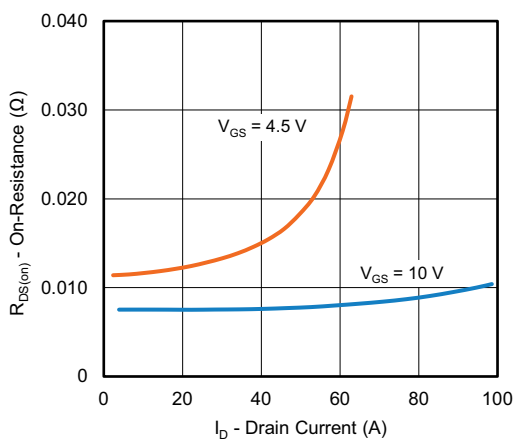
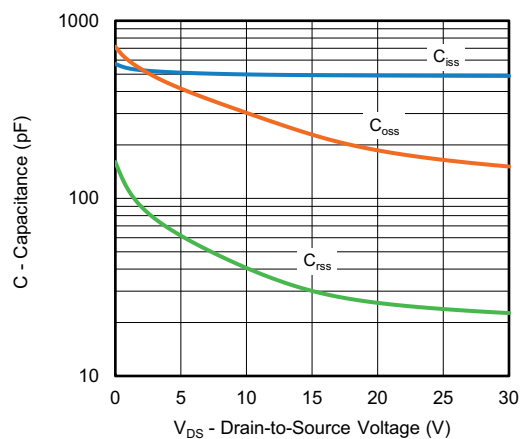
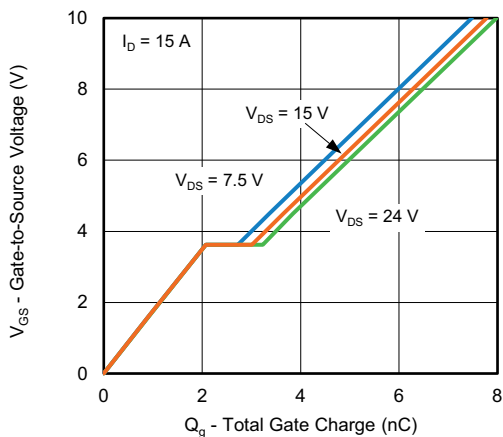
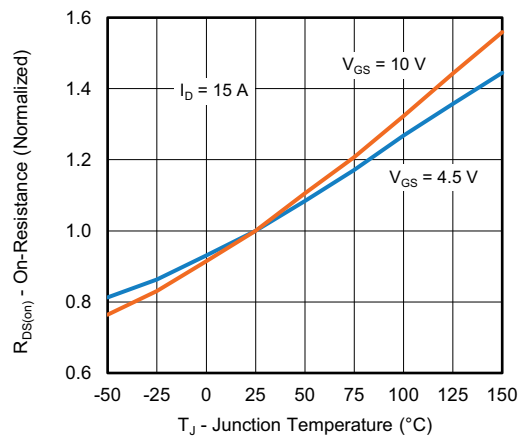
SPECIFICATIONS ($T_J = 25$ °C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-source breakdown voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	30	-	-	V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.1	-	2.4	
Gate-source leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = +20 V / -16 V	-	-	± 100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V	-	-	1	μA
		V _{DS} = 30 V, V _{GS} = 0 V, T _J = 55 °C	-	-	5	
Drain-source on-state resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 10 A	-	0.0075	0.0092	Ω
		V _{GS} = 4.5 V, I _D = 7 A	-	0.012	0.0155	
Forward transconductance ^a	g _{fs}	V _{DS} = 10 V, I _D = 10 A	-	23	-	S
Dynamic ^b						
Input capacitance	C _{iss}	V _{DS} = 15 V, V _{GS} = 0 V, f = 1 MHz	-	500	-	pF
Output capacitance	C _{oss}		-	230	-	
Reverse transfer capacitance	C _{rss}		-	30	-	
C _{rss} /C _{iss} ratio			-	0.062	0.12	
Total gate charge	Q _g	V _{DS} = 15 V, V _{GS} = 10 V, I _D = 15 A	-	8.4	12.6	nC
		V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 15 A	-	4	6	
Q _{gs}	-		2.2	-		
Q _{gd}	-		1.0	-		
Gate resistance	R _g	f = 1 MHz	0.2	1.2	2	Ω
Turn-on delay time	t _{d(on)}	V _{DD} = 15 V, R _L = 1.5 Ω, I _D ≅ 10 A, V _{GEN} = 10 V, R _g = 1 Ω	-	10	20	ns
Rise time	t _r		-	20	40	
Turn-off delay time	t _{d(off)}		-	13	25	
Fall time	t _f		-	5	10	
Turn-on delay time	t _{d(on)}	V _{DD} = 15 V, R _L = 1.5 Ω, I _D ≅ 10 A, V _{GEN} = 4.5 V, R _g = 1 Ω	-	12	25	
Rise time	t _r		-	100	200	
Turn-off delay time	t _{d(off)}		-	10	20	
Fall time	t _f		-	10	20	
Drain-source Body Diode Characteristics						
Continuous source-drain diode current	I _S	T _C = 25°C	-	-	13.9	A
Pulse diode forward current	I _{SM}		-	-	100	
Body diode voltage	V _{SD}	I _S = 8 A, V _{GS} = 0 V	-	0.83	1.2	V
Body diode reverse recovery time	t _{rr}	I _F = 10 A, di/dt = 100 A/μs, T _J = 25 °C	-	15	30	ns
Body diode reverse recovery charge	Q _{rr}		-	4	10	nC
Reverse recovery fall time	t _a		-	7.5	-	ns
Reverse recovery rise time	t _b		-	7.5	-	

Notesa. Pulse test; pulse width ≤ 300 μ s, duty cycle ≤ 2 %

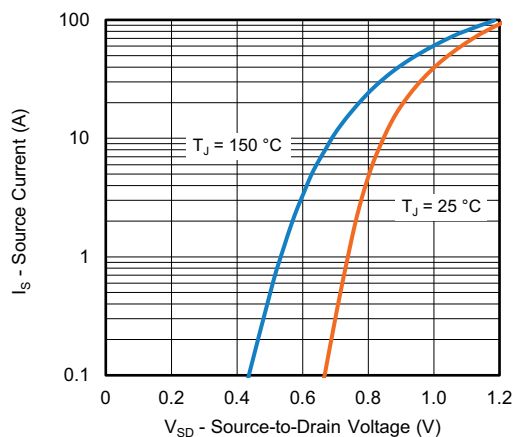
b. Guaranteed by design, not subject to production testing

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.

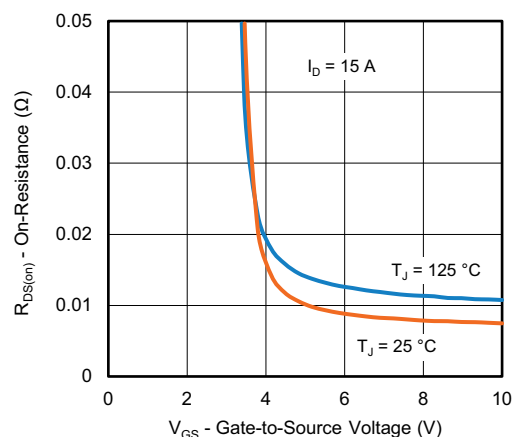
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Output Characteristics

Transfer Characteristics

On-Resistance vs. Drain Current and Gate

Capacitance

Gate Charge

On-Resistance vs. Junction Temperature



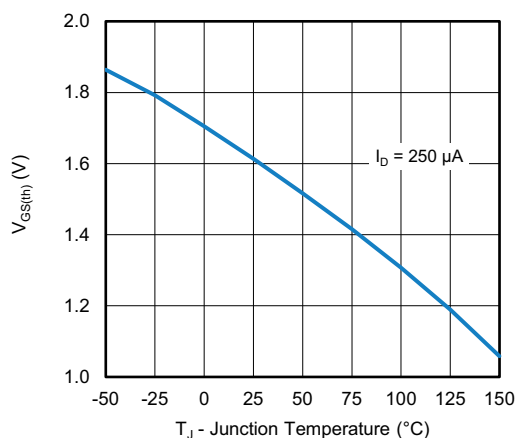
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



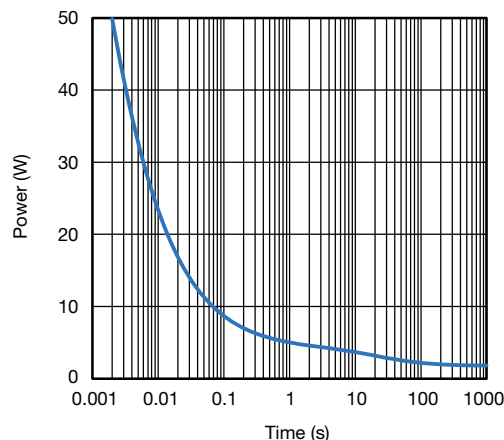
Source-Drain Diode Forward Voltage



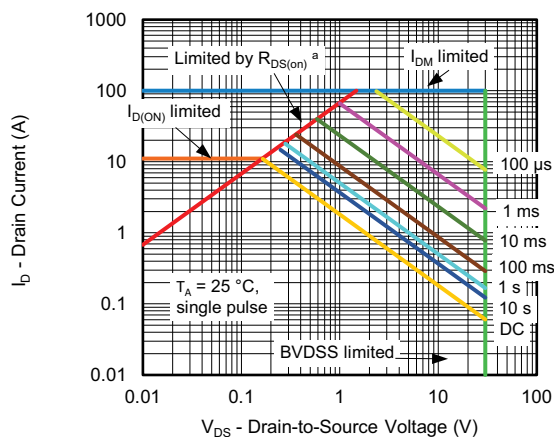
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



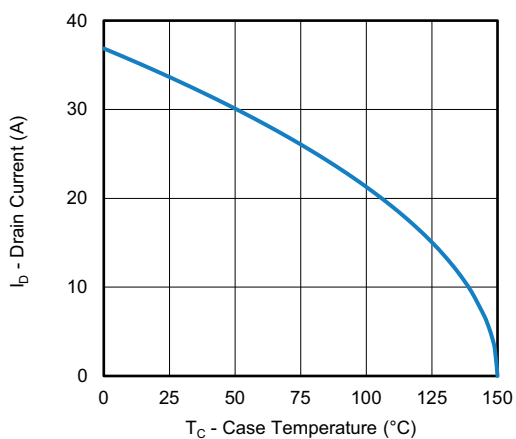
Safe Operating Area, Junction-to-Ambient

Note

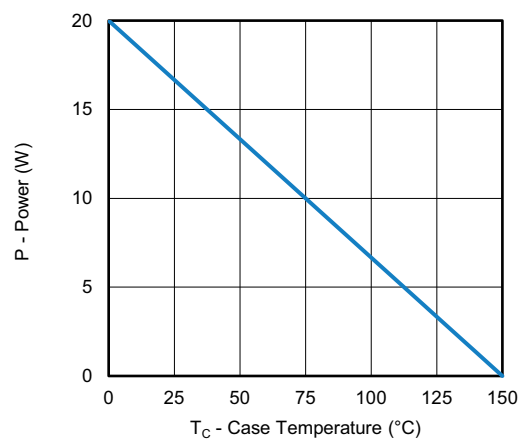
a. $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Current Derating ^a



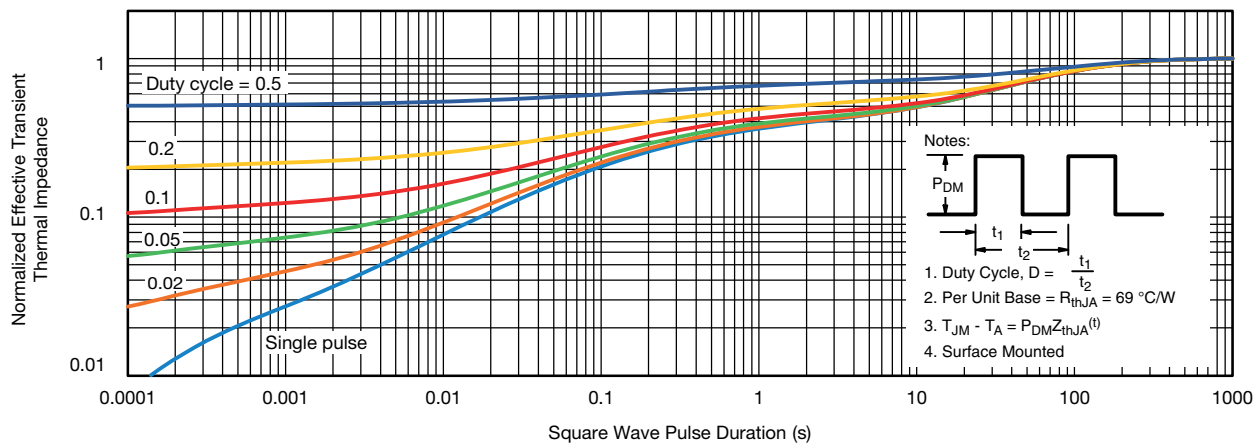
Power, Junction-to-Case

Notes

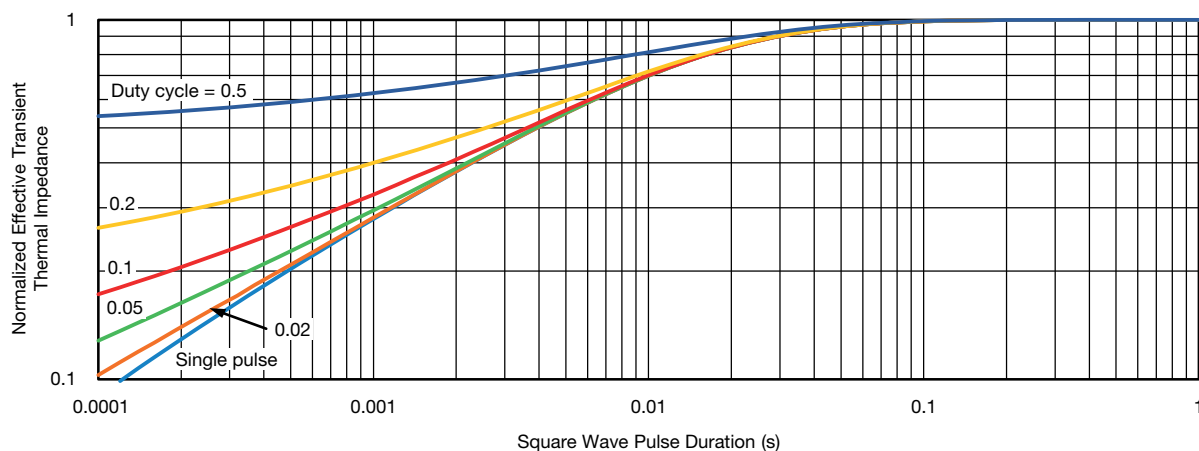
- a. The power dissipation P_D is based on T_J max. = 150 °C, using junction-to-ambient thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit



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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