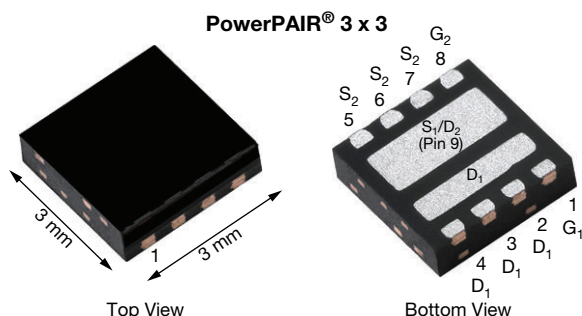


# Dual N-Channel 30 V (D-S) MOSFET



## FEATURES

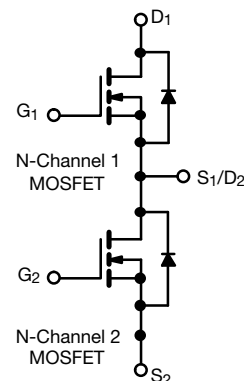
- TrenchFET® Gen IV power MOSFET
- High side and low side MOSFETs form optimized combination for 50 % duty cycle
- Optimized  $R_{DS(on)}$  -  $Q_g$  and  $R_{DS(on)}$  -  $Q_{gd}$  FOM elevates efficiency for high frequency switching
- 100 %  $R_g$  and UIS tested
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://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. ( $\Omega$ ) at $V_{GS} = 10$ V	0.0092
$R_{DS(on)}$ max. ( $\Omega$ ) at $V_{GS} = 4.5$ V	0.0155
$Q_g$ typ. (nC)	3.7
$I_D$ (A)	33.6 <sup>a</sup>
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)	$T_C = 25$ °C	33.6	A
	$T_C = 70$ °C	26.9	
	$T_A = 25$ °C	15.8 <sup>b, c</sup>	
	$T_A = 70$ °C	12.6 <sup>b, c</sup>	
Pulsed drain current ( $t = 100$ $\mu$ s)	$I_{DM}$	100	mJ
Continuous source current (MOSFET diode conduction)	$T_C = 25$ °C	13.9	
	$T_A = 25$ °C	3.1 <sup>b, c</sup>	
Single pulse avalanche current	$L = 0.1$ mH	10	mJ
Single pulse avalanche energy	$E_{AS}$	5	
Maximum power dissipation	$T_C = 25$ °C	16.7	W
	$T_C = 70$ °C	10.7	
	$T_A = 25$ °C	3.7 <sup>b, c</sup>	
	$T_A = 70$ °C	2.4 <sup>b, c</sup>	
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 <sup>a, b</sup>	$t \leq 10$ 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 <sub>DS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	30	-	-	V
Gate-source threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	1.1	-	2.4	
Gate-source leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = +20 V / -16 V	-	-	± 100	nA
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V	-	-	1	μA
		V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 55 °C	-	-	5	
Drain-source on-state resistance <sup>a</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 10 A	-	0.0075	0.0092	Ω
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 7 A	-	0.012	0.0155	
Forward transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 10 A	-	23	-	S
Dynamic <sup>b</sup>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 0 V, f = 1 MHz	-	500	-	pF
Output capacitance	C <sub>oss</sub>		-	230	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	30	-	
C <sub>rss</sub> /C <sub>iss</sub> ratio			-	0.062	0.12	
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 15 A	-	8.4	12.6	nC
		V <sub>DS</sub> = 15 V, V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 15 A	-	4	6	
Gate-source charge	Q <sub>gs</sub>		-	2.2	-	
Gate-drain charge	Q <sub>gd</sub>		-	1.0	-	
Gate resistance	R <sub>g</sub>	f = 1 MHz	0.2	1.2	2	Ω
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = 15 V, R <sub>L</sub> = 1.5 Ω, I <sub>D</sub> ≅ 10 A, V <sub>GEN</sub> = 10 V, R <sub>g</sub> = 1 Ω	-	10	20	ns
Rise time	t <sub>r</sub>		-	20	40	
Turn-off delay time	t <sub>d(off)</sub>		-	13	25	
Fall time	t <sub>f</sub>		-	5	10	
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> = 15 V, R <sub>L</sub> = 1.5 Ω, I <sub>D</sub> ≅ 10 A, V <sub>GEN</sub> = 4.5 V, R <sub>g</sub> = 1 Ω	-	12	25	
Rise time	t <sub>r</sub>		-	100	200	
Turn-off delay time	t <sub>d(off)</sub>		-	10	20	
Fall time	t <sub>f</sub>		-	10	20	
Drain-source Body Diode Characteristics						
Continuous source-drain diode current	I <sub>S</sub>	T <sub>C</sub> = 25°C	-	-	13.9	A
Pulse diode forward current	I <sub>SM</sub>		-	-	100	
Body diode voltage	V <sub>SD</sub>	I <sub>S</sub> = 8 A, V <sub>GS</sub> = 0 V	-	0.83	1.2	V
Body diode reverse recovery time	t <sub>rr</sub>	I <sub>F</sub> = 10 A, di/dt = 100 A/μs, T <sub>J</sub> = 25 °C	-	15	30	ns
Body diode reverse recovery charge	Q <sub>rr</sub>		-	4	10	nC
Reverse recovery fall time	t <sub>a</sub>		-	7.5	-	ns
Reverse recovery rise time	t <sub>b</sub>		-	7.5	-	

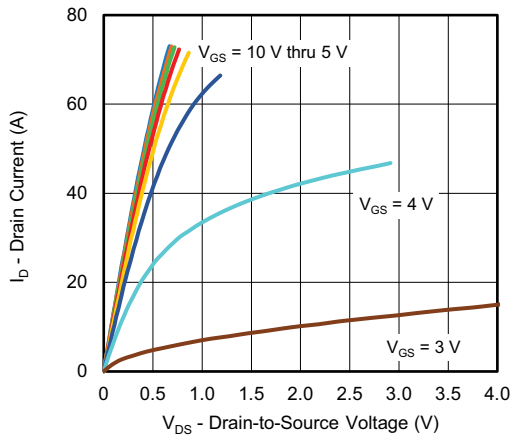
**Notes**a. Pulse test; pulse width  $\leq 300$   $\mu$ s, duty cycle  $\leq 2$  %

b. Guaranteed by design, not subject to production testing

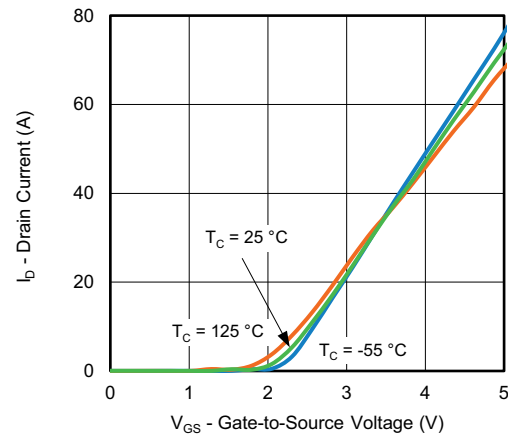
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



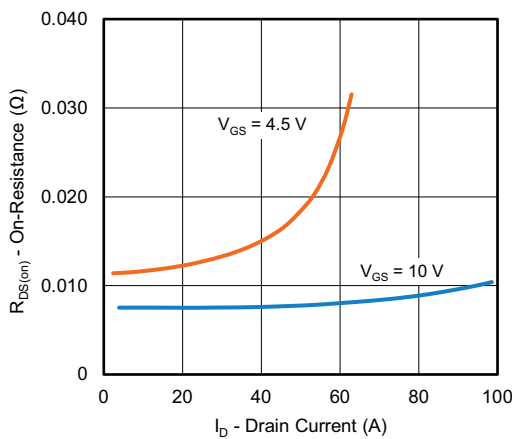
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



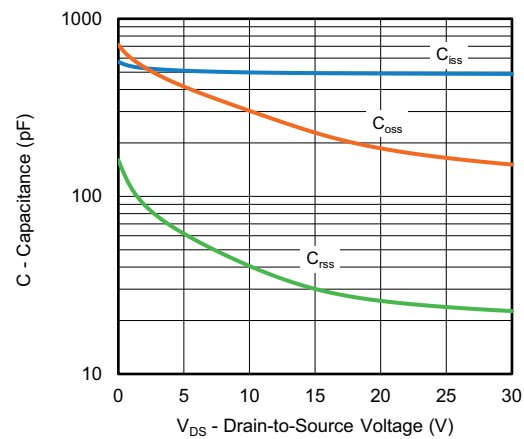
**Output Characteristics**



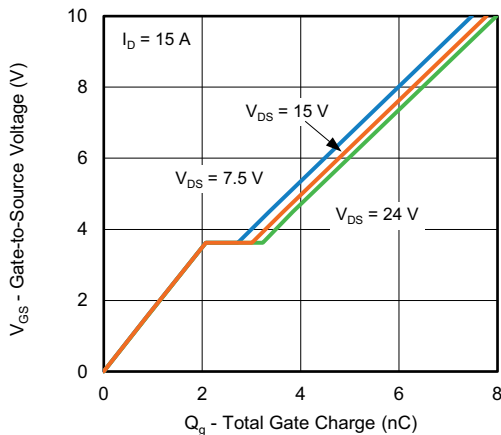
**Transfer Characteristics**



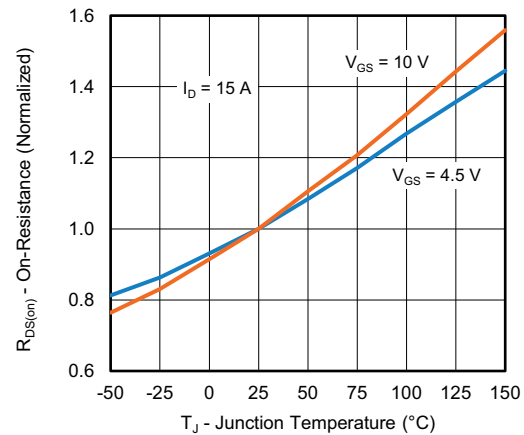
**On-Resistance vs. Drain Current and Gate**



**Capacitance**



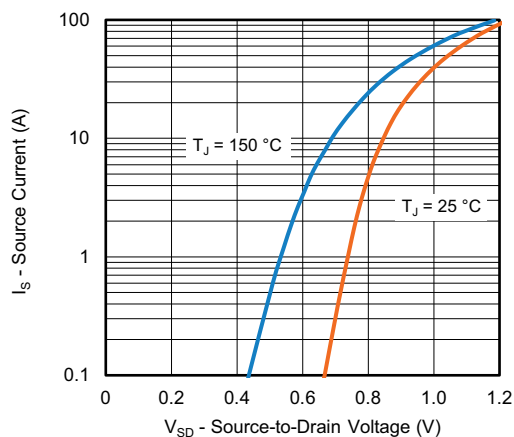
**Gate Charge**



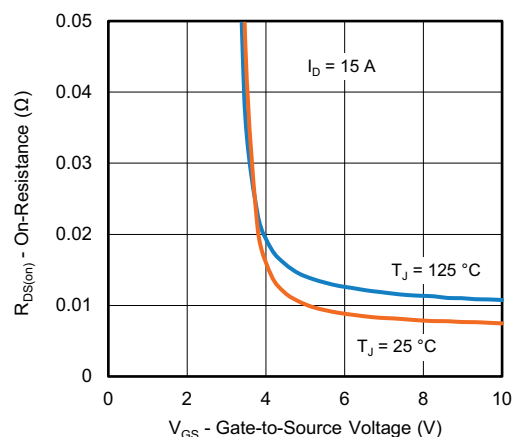
**On-Resistance vs. Junction Temperature**



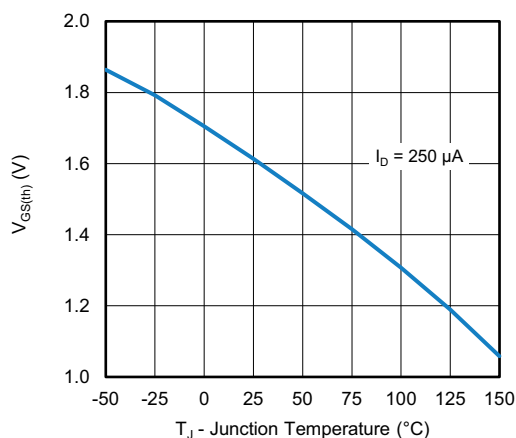
**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)



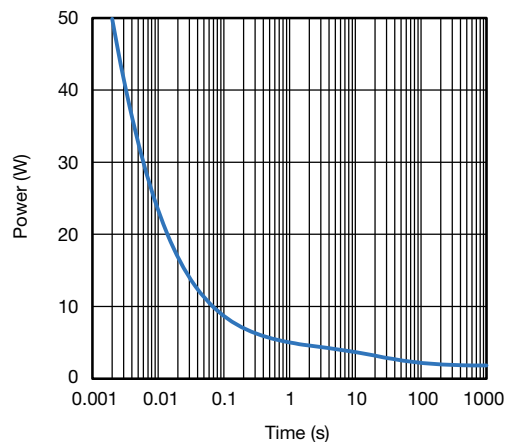
**Source-Drain Diode Forward Voltage**



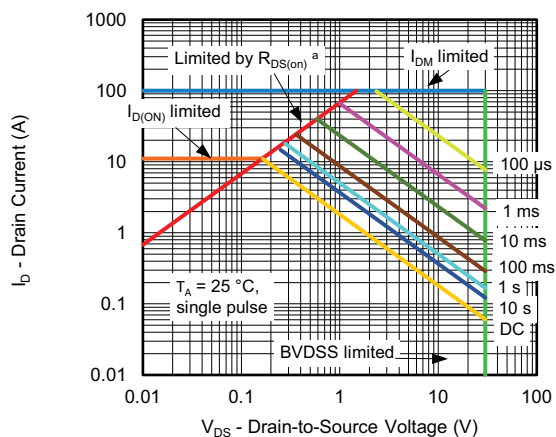
**On-Resistance vs. Gate-to-Source Voltage**



**Threshold Voltage**



**Single Pulse Power**



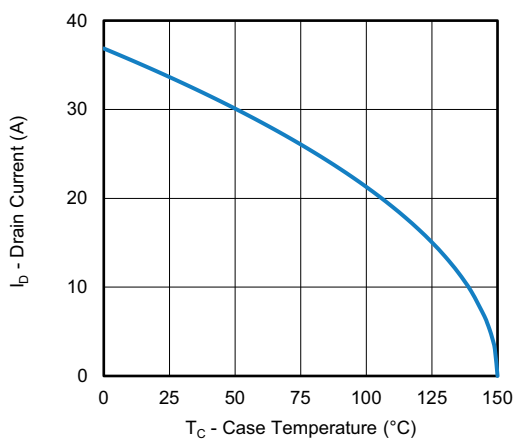
**Safe Operating Area, Junction-to-Ambient**

**Note**

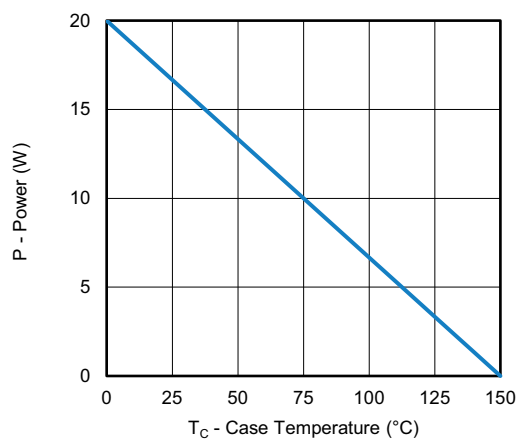
a.  $V_{GS} >$  minimum  $V_{GS}$  at which  $R_{DS(on)}$  is specified



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



**Current Derating <sup>a</sup>**



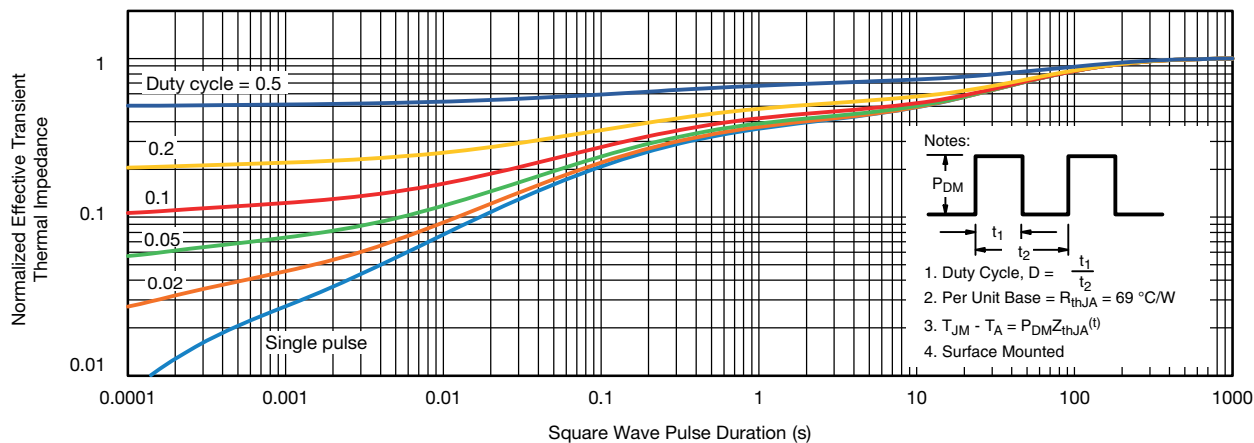
**Power, Junction-to-Case**

**Notes**

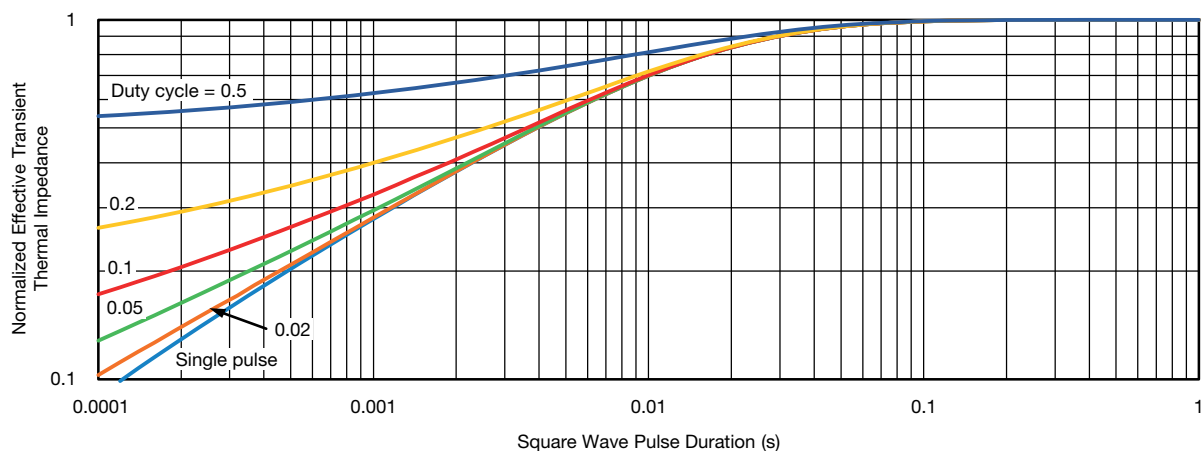
- a. The power dissipation  $P_D$  is based on  $T_J$  max. = 150 °C, using junction-to-ambient thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package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