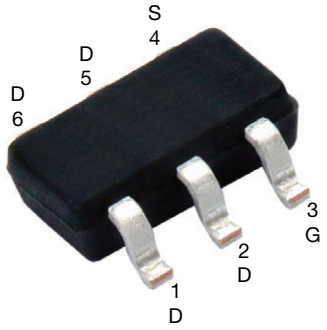
N-Channel 100 V (D-S) MOSFET

TSOP-6 Single



Top View

FEATURES

- TrenchFET® power MOSFET
- PWM optimized for fast switching in small footprint
- 100 % R_g tested
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

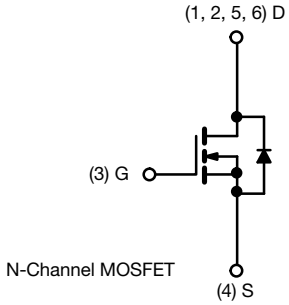
Pb-free

RoHS COMPLIANT

HALOGEN FREE Available

APPLICATIONS

- Primary side switch for low power DC/DC converters



PRODUCT SUMMARY	
V_{DS} (V)	100
$R_{DS(on)}$ max. (Ω) at V_{GS} = 10 V	0.375
$R_{DS(on)}$ max. (Ω) at V_{GS} = 6 V	0.400
Q_g typ. (nC)	5.4
I_D (A)	1.5
Configuration	Single

ORDERING INFORMATION	
Package	TSOP-6
Lead (Pb)-free and halogen-free	Si3444DV-T1-GE3

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

PARAMETER		SYMBOL	5 s	STEADY STATE	UNIT
Drain-Source Voltage		V_{DS}	100		V
Gate-Source Voltage		V_{GS}	± 20		
Continuous Drain Current (T_J = 175 °C) [a]	T_A = 25 °C	I_D	1.5	1.2	A
	T_A = 85 °C		1.1	0.8	
Pulsed Drain Current		I_{DM}	6		
Single Avalanche Current	L = 0.1 mH	I_{AS}	3		
Single Avalanche Energy (Duty Cycle ≤ 1 %)		E_{AS}	0.45		mJ
Continuous Source Current (Diode Conduction) [a]		I_S	1.7	1	A
Maximum Power Dissipation [a]	T_A = 25 °C	P_D	2	1.14	W
	T_A = 85 °C		1	0.59	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to +150		°C

THERMAL RESISTANCE RATINGS

PARAMETER		SYMBOL	TYPICAL	MAXIMUM	UNIT
Maximum junction-to-ambient [a]	t ≤ 5 s	R_{thJA}	45	62.5	°C/W
	Steady state		90	110	
Maximum junction-to-foot (drain)	Steady state	R_{thJF}	25	30	

Note

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

SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static						
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	2	-	4	V
Gate-body leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	± 100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} = 150 V, V_{GS} = 0 V	-	-	1	µA
		V_{DS} = 150 V, V_{GS} = 0 V, T_J = 85 °C	-	-	5	
On-state drain current [a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	4	-	-	A
Drain-source on-state resistance [a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 1.5 A	-	0.310	0.375	Ω
		V_{GS} = 6 V, I_D = 1.4 A	-	0.330	0.400	
Forward transconductance [a]	g_{fs}	V_{DS} = 15 V, I_D = 1.5 A	-	4.1	-	S
Diode forward voltage [a]	V_{SD}	I_S = 1.7 A, V_{GS} = 0 V	-	0.8	1.2	V
Dynamic [b]						
Total gate charge	Q_g	V_{DS} = 75 V, V_{GS} = 10 V, I_D = 1.5 A	-	5.4	8	nC
Gate-source charge	Q_{gs}		-	1.1	-	
Gate-drain charge	Q_{gd}		-	1.9	-	
Gate resistance	R_g	f = 1 MHz	4	9	15	Ω
Turn-on delay time	$t_{d(on)}$	V_{DD} = 75 V, R_L = 75 Ω I_D ≅ 1 A, V_{GEN} = 10 V, R_g = 6 Ω	-	8	15	ns
Rise time	t_r		-	5	15	
Turn-off delay time	$t_{d(off)}$		-	20	30	
Fall time	t_f		-	5	25	
Source-drain reverse recovery time	t_{rr}	I_F = 1.7 A, dI/dt = 100 A/µs	-	35	60	

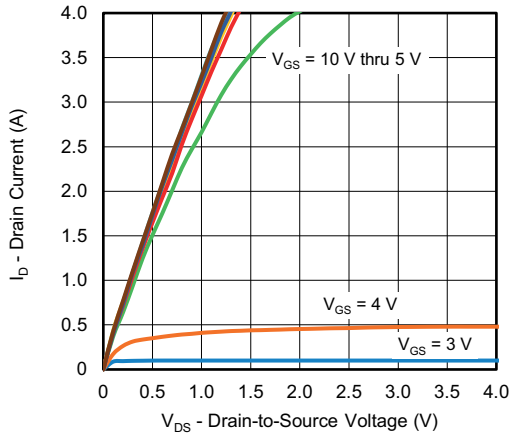
Notes

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %

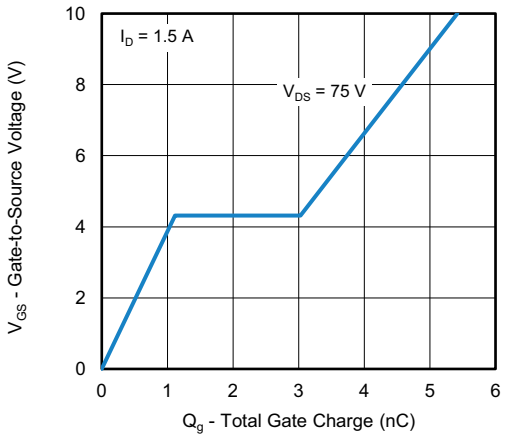
b. Guaranteed by design, not subject to production testing

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.

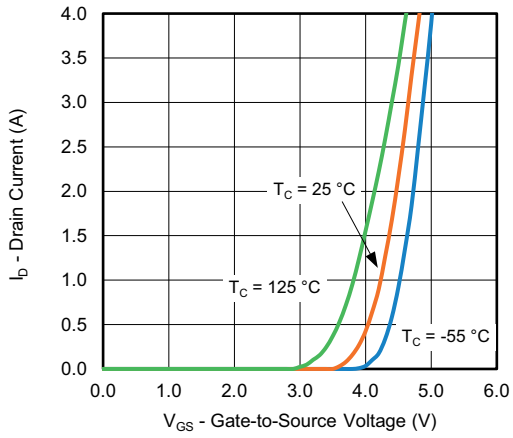
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



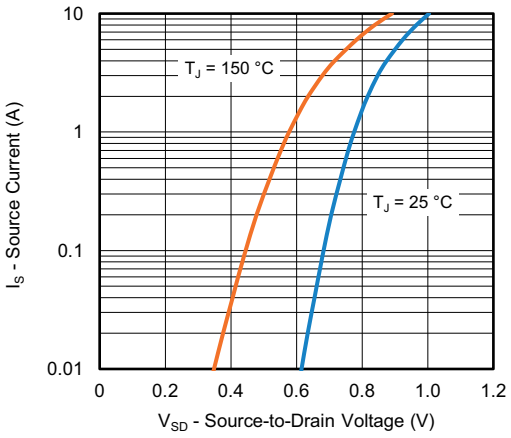
Output Characteristics



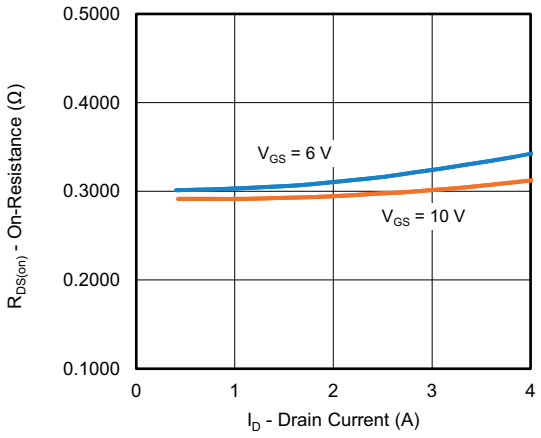
Gate Charge



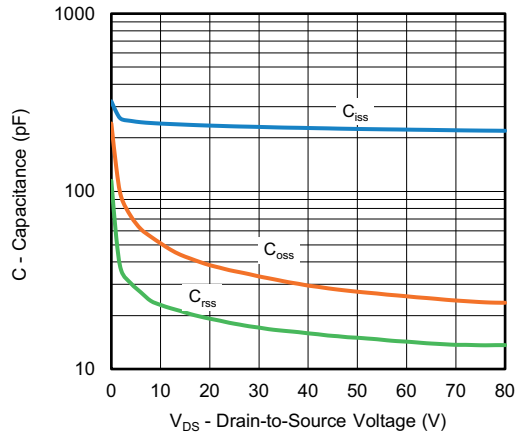
Transfer Characteristics



Source-Drain Diode Forward Voltage

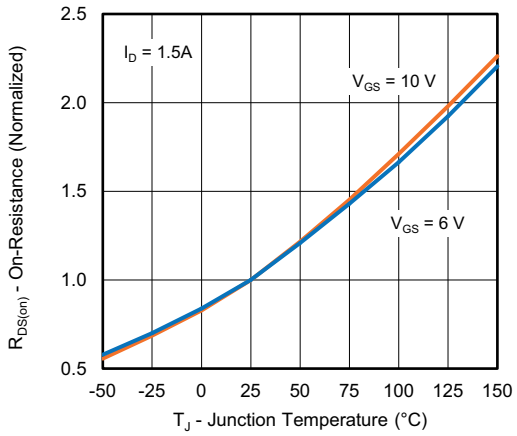


On-Resistance vs. Drain Current

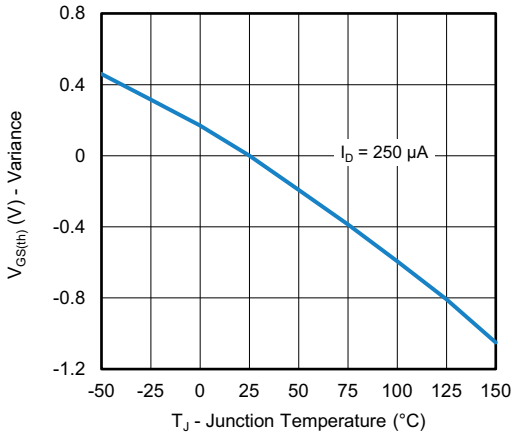


Capacitance

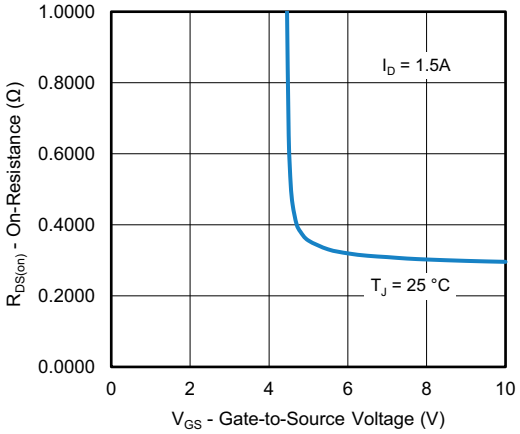
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



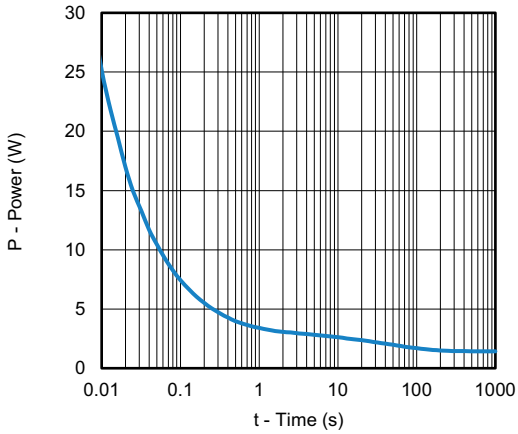
On-Resistance vs. Junction Temperature



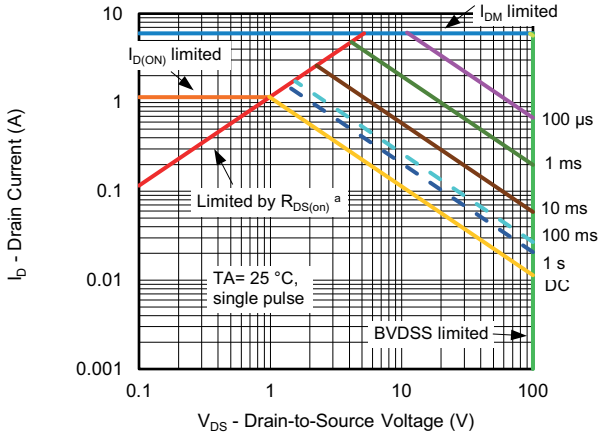
Threshold Voltage



On-Resistance vs. Gate-to-Source Voltage

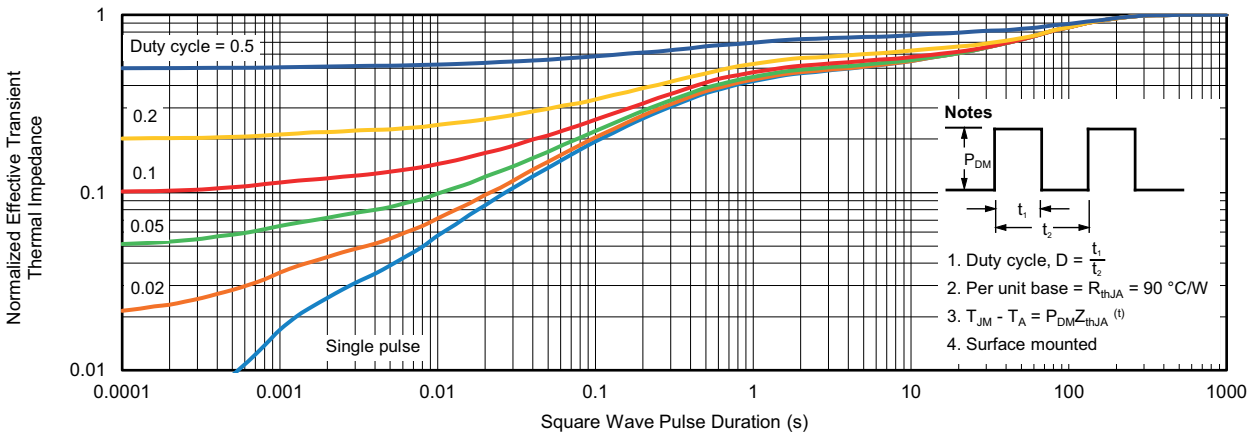


Single Pulse Power

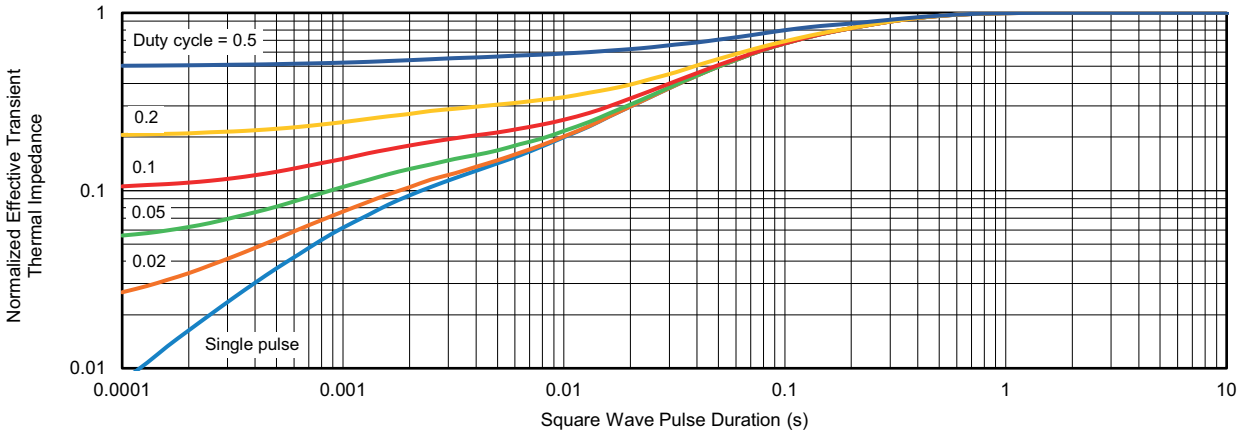


Safe Operating Area

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

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