



New Product

Si4447DY
Vishay Siliconix

P-Channel 40-V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ)
-40	0.054 at $V_{GS} = -10$ V	-4.5	9
	0.072 at $V_{GS} = -4.5$ V	-3.9	

FEATURES

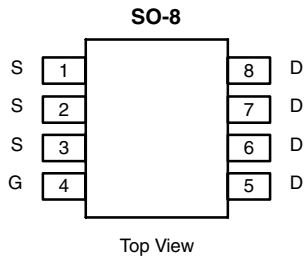
- TrenchFET® Power MOSFET
- 100 % R_g Tested
- UIS Tested

APPLICATIONS

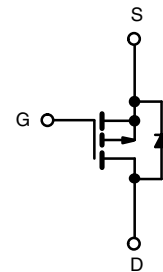
- CCFL Inverter



RoHS
COMPLIANT



Ordering Information: Si4447DY-T1-E3 (Lead (Pb)-free)



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C UNLESS OTHERWISE NOTED)				
Parameter	Symbol	10 secs	Steady State	Unit
Drain-Source Voltage	V_{DS}	-40		V
Gate-Source Voltage	V_{GS}	± 16		
Continuous Drain Current ($T_J = 150$ °C) ^a	$T_A = 25$ °C	-4.5	-3.3	A
	$T_A = 70$ °C	-3.6	-2.7	
Pulsed Drain Current	I_{DM}	30		
Continuous Source Current (Diode Conduction) ^a	I_S	-1.7	-0.9	
Avalanche Current	$L = 0.1$ mH	I_{AS}	16	
Single Pulse Avalanche Energy		E_{AS}	13	
Maximum Power Dissipation ^a	$T_A = 25$ °C	2	1.1	W
	$T_A = 70$ °C	1.3	0.7	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150		°C

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Typ	Max	Unit
Maximum Junction-to-Ambient ^a	R_{thJA}	$t \leq 10$ sec	50	62.5
		Steady State	85	110
Maximum Junction-to-Foot (Drain)	R_{thJF}	30	40	°C/W

Notes

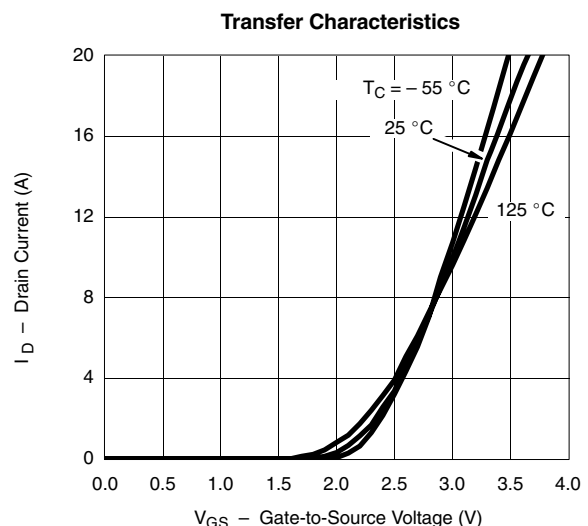
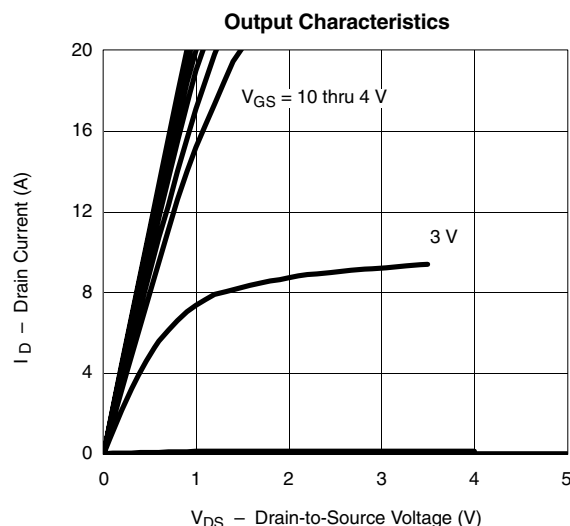
a. Surface Mounted on 1" x 1" FR4 Board.

SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA	-0.8		-2.2	
V _{DS} Temperature Coefficient	ΔV _{DS/TJ}	I _D = 250 μA		-40		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)/TJ}			3.4		
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±16 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -40 V, V _{GS} = 0 V			-1	μA
		V _{DS} = -40 V, V _{GS} = 0 V, T _J = 55 °C			-10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≤ -5 V, V _{GS} = -10 V	-20			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = -10 V, I _D = -4.5 A		0.045	0.054	Ω
		V _{GS} = -4.5 V, I _D = -3.9 A		0.059	0.072	
Forward Transconductance ^a	g _{fs}	V _{DS} = -15 V, I _D = -4.5 A		13		S
Diode Forward Voltage ^a	V _{SD}	I _S = -1.7 A, V _{GS} = 0 V		-0.79	-1.2	V
Dynamic^b						
Input Capacitance	C _{iss}	P-Channel V _{DS} = -20 V, V _{GS} = 0 V, f = 1 MHz		805		pF
Output Capacitance	C _{oss}			120		
Reverse Transfer Capacitance	C _{rss}			85		
Total Gate Charge	Q _g	P-Channel V _{DS} = -20 V, V _{GS} = -4.5 V, I _D = -4.5 A		9	14	nC
Gate-Source Charge	Q _{gs}			2		
Gate-Drain Charge	Q _{gd}			3.6		
Gate Resistance	R _g	f = 1 MHz		11.5	18	Ω
Turn-On Delay Time	t _{d(on)}	P-Channel V _{DD} = -15 V, R _L = 15 Ω I _D ≅ -1 A, V _{GEN} = -10 V, R _g = 6 Ω		8	13	ns
Rise Time	t _r			12	18	
Turn-Off Delay Time	t _{d(off)}			74	110	
Fall Time	t _f			38	60	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 1.7 A, di/dt = 100 A/μs		27	45	ns
Body Diode Reverse Recovery Charge	Q _{rr}	I _F = 1.7 A, di/dt = 100 A/μs		17	26	nC

Notes

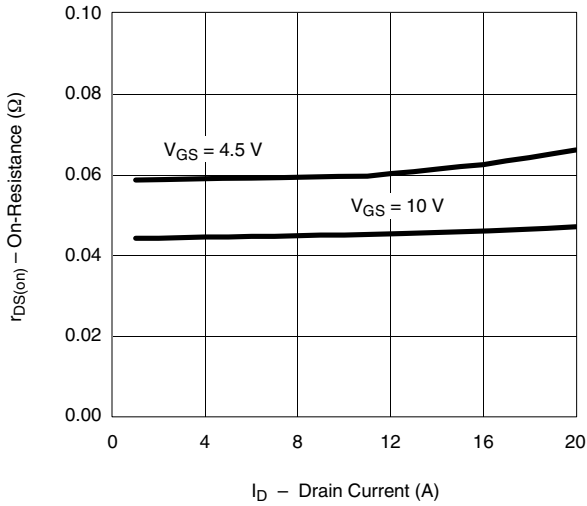
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

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.

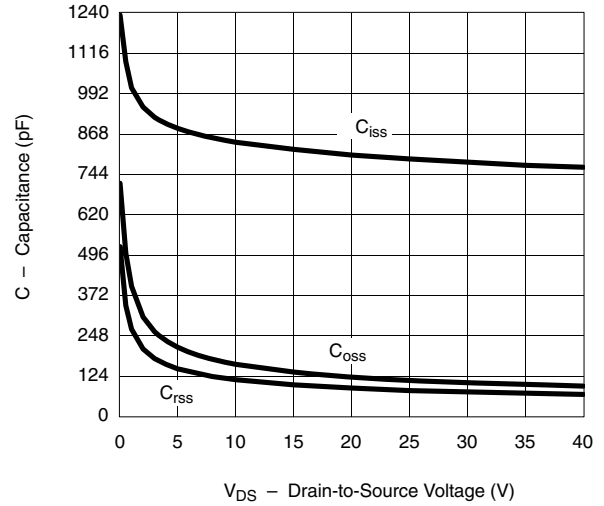
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)


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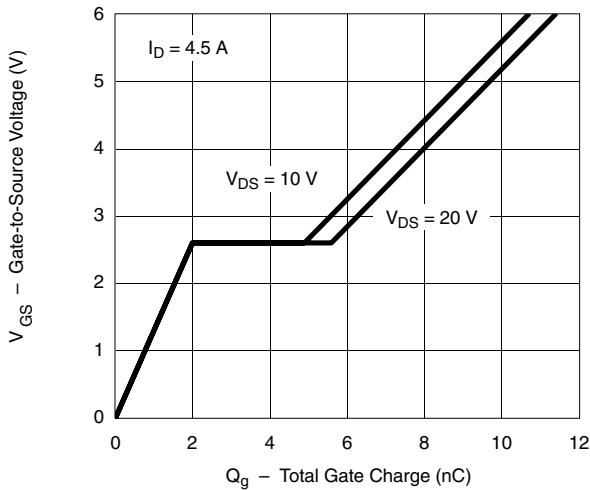
On-Resistance vs. Drain Current



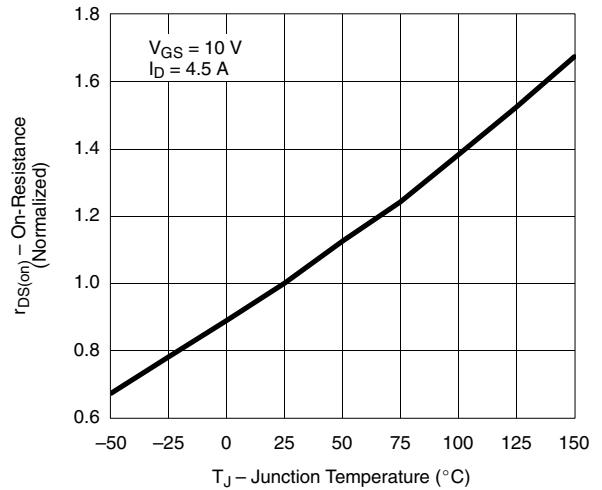
Capacitance



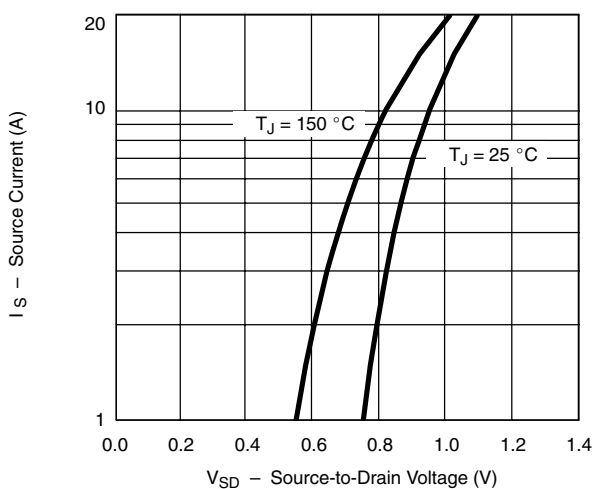
Gate Charge



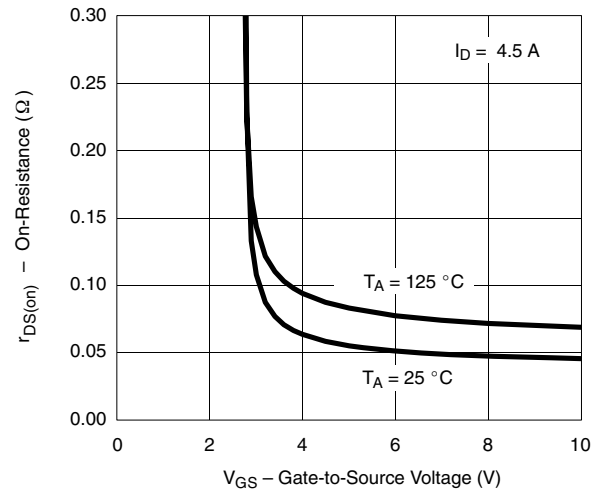
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

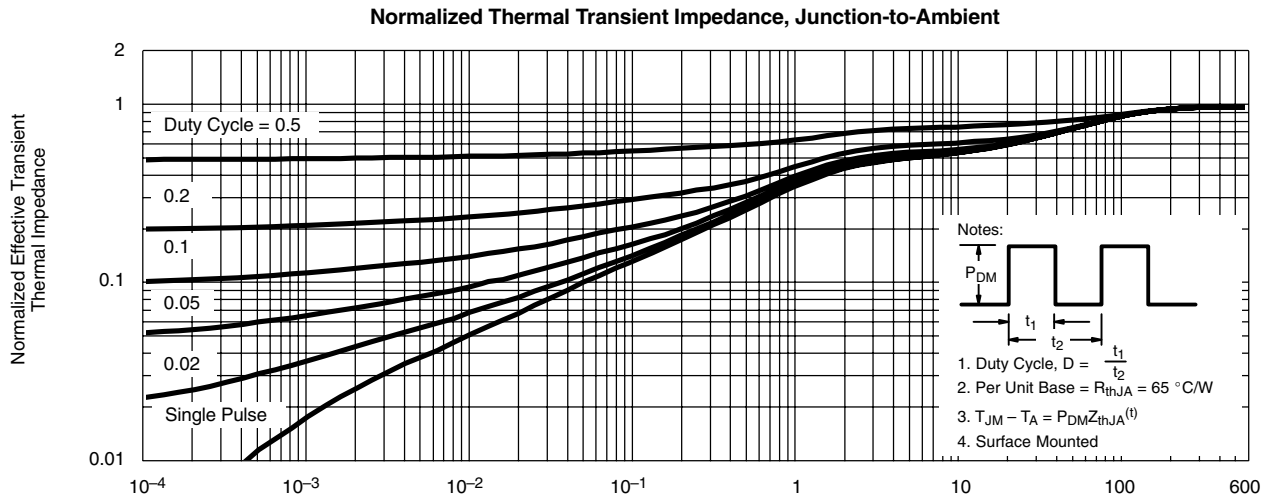
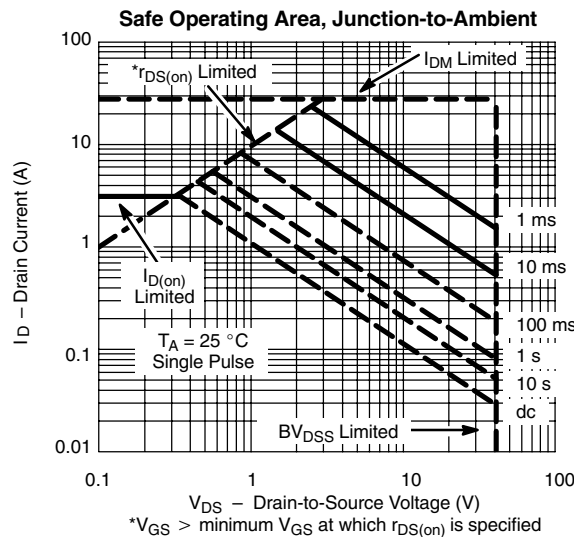
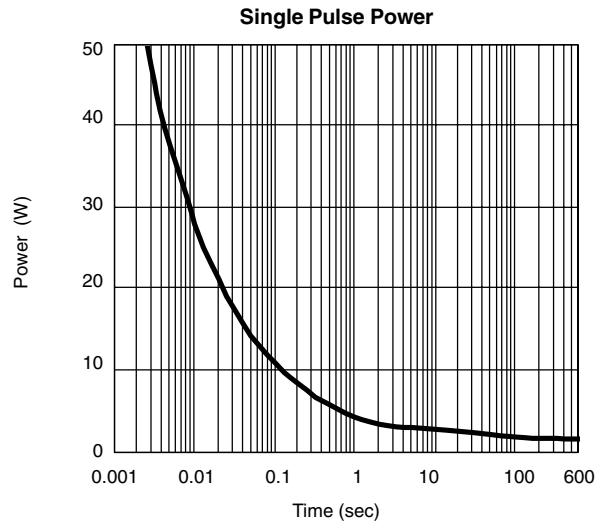
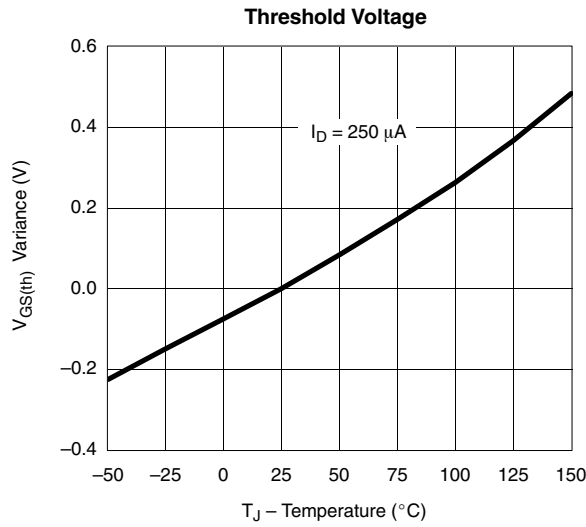


On-Resistance vs. Gate-to-Source Voltage



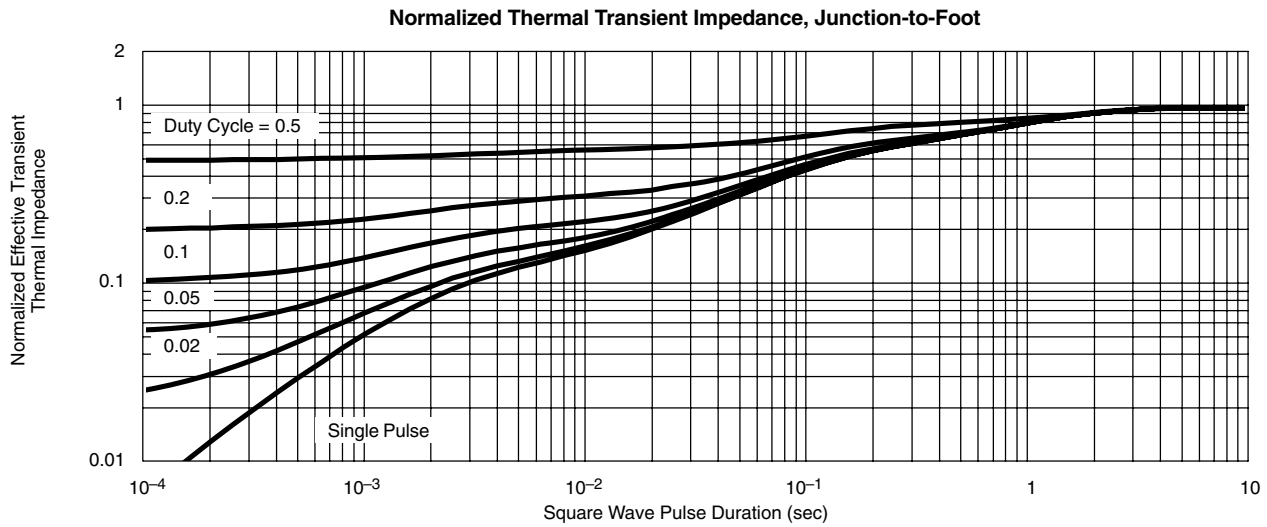


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



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