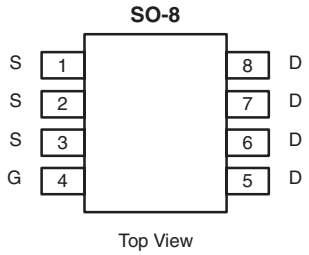
P-Channel 1.8-V (G-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)[b]	Q_g (Typ.)
- 8	0.009 at V_{GS} = - 4.5 V	- 13.7	55 nC
	0.011 at V_{GS} = - 2.5 V	- 12.4	
	0.016 at V_{GS} = - 1.8 V	- 10	

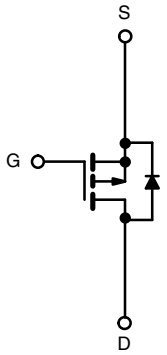
FEATURES

- **Halogen-free According to IEC 61249-2-21 Available**
- TrenchFET® Power MOSFET
- 1.8 V Rated
- 100 % R_g Tested

Pb-free
RoHS COMPLIANT
HALOGEN FREE Available



Top View



P-Channel MOSFET

Ordering Information: Si4465ADY-T1-E3 (Lead (Pb)-free)
Si4465ADY-T1-GE3 (Lead (Pb)-free and Halogen-free)

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted				
Parameter		**Symbol**	**Limit**	**Unit**
Drain-Source Voltage		V_{DS}	- 8	V
Gate-Source Voltage		V_{GS}	± 8	
Continuous Drain Current (T_J = 150 °C)[a, b]	T_A = 25 °C	I_D	- 13.7	A
	T_A = 70 °C		- 11	
	T_C = 25 °C		- 20	
	T_C = 70 °C		- 16	
Pulsed Drain Current		I_{DM}	- 40	
Continuous Source Current (Diode Conduction)[a, b]		I_S	- 2.5	
		I_{SM}	40	
Maximum Power Dissipation[a, b]	T_A = 25 °C	P_D	3.0	W
	T_A = 70 °C		1.95	
	T_C = 25 °C		6.5	
	T_C = 70 °C		4.2	
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 (MOSFET)[a]	t ≤ 10 s	R_{thJA}	34	41	°C/W
	Steady State		67	80	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	15	19	

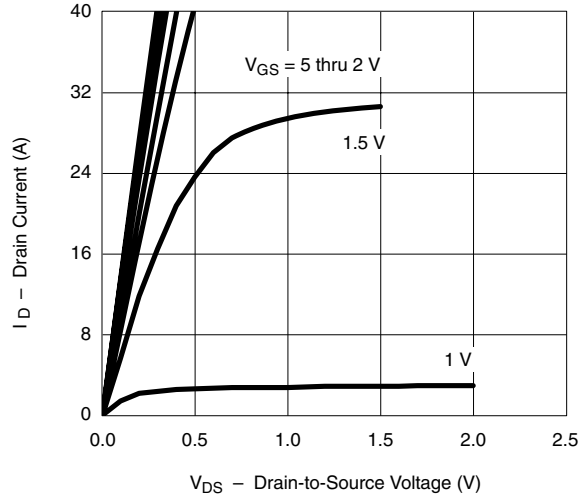
Notes:
a. Surface Mounted on 1" x 1" FR4 board.
b. t ≤ 10 s.

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	- 0.45		- 1.0	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 8 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 8 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 8 V, V_{GS} = 0 V, T_J = 55 °C			- 5	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \geq$ – 5 V, V_{GS} = - 4.5 V	- 20			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 4.5 V, I_D = - 14 A		0.0075	0.009	Ω
		V_{GS} = - 2.5 V, I_D = - 12 A		0.0092	0.011	
		V_{GS} = 1.8 V, I_D = 10 A		0.013	0.016	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 10 V, I_D = - 14 A		58		S
Diode Forward Voltage[a]	V_{SD}	I_S = - 2.1 A, V_{GS} = 0 V		- 0.57	- 1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = - 4 V, V_{GS} = - 4.5 V, I_D = - 14 A		55	85	nC
Gate-Source Charge	Q_{gs}			6		
Gate-Drain Charge	Q_{gd}			10		
Gate Resistance	R_g			2.5	3.8	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 4 V, R_L = 4 Ω $I_D \cong$ - 10 A, V_{GEN} = - 4.5 V, R_g = 6 Ω		33	50	ns
Rise Time	t_r			170	255	
Turn-Off Delay Time	$t_{d(off)}$			168	255	
Fall Time	t_f			112	170	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = - 2.1 A, dI/dt = 100 A/µs		85	130	
Body Diode Reverse Recovery Charge	Q_{rr}			81	125	nC

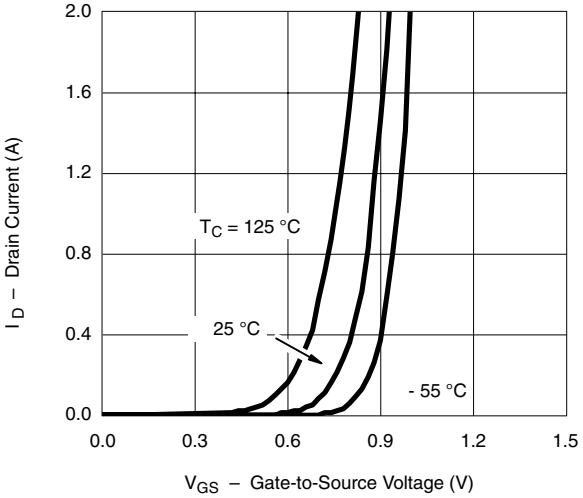
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

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.

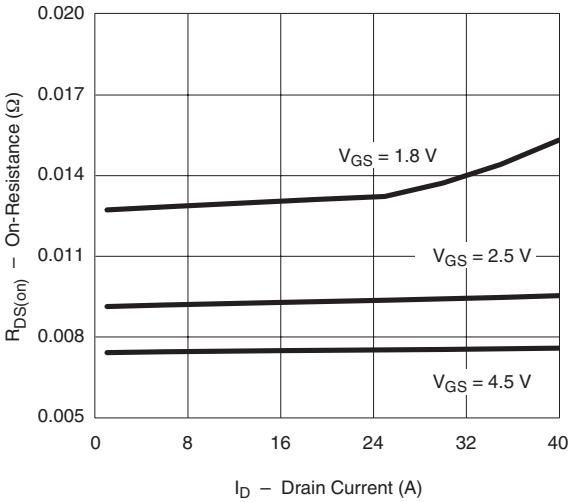
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



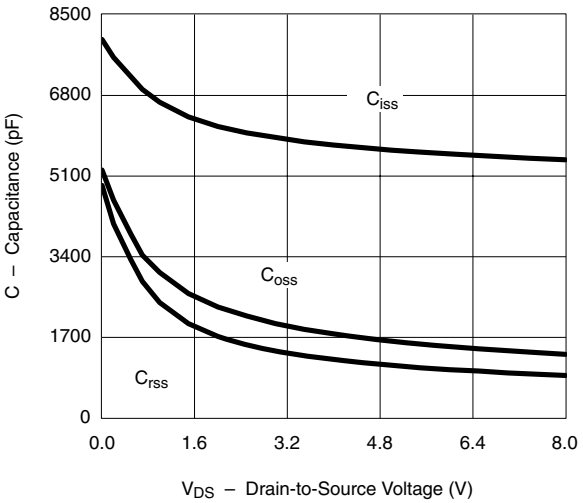
Output Characteristics



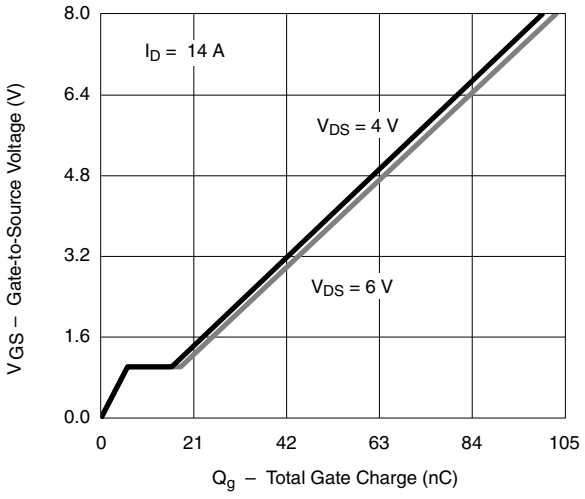
Transfer Characteristics



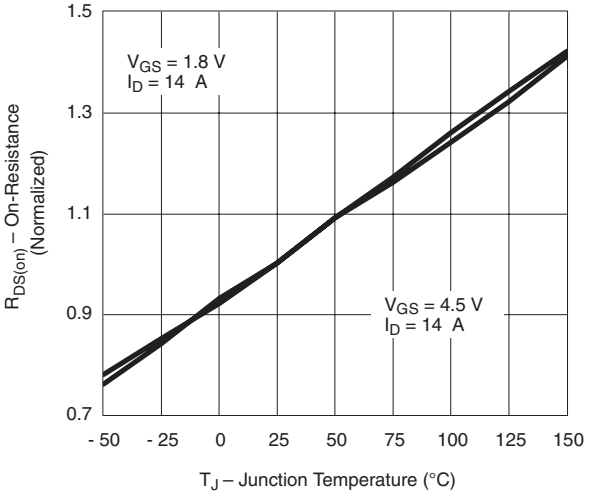
On-Resistance vs. Drain Current



Capacitance

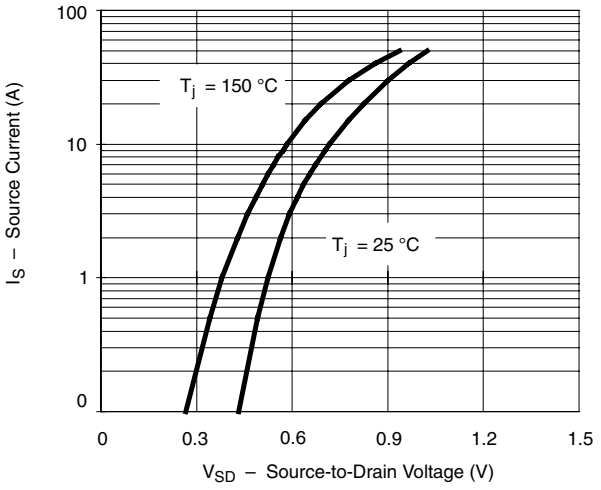


Gate Charge

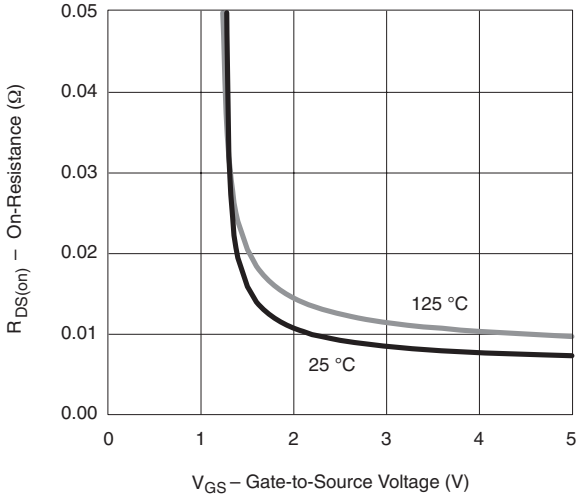


On-Resistance vs. Junction Temperature

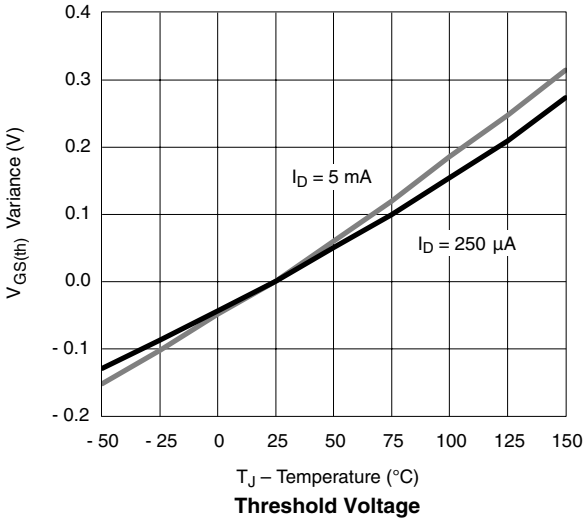
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



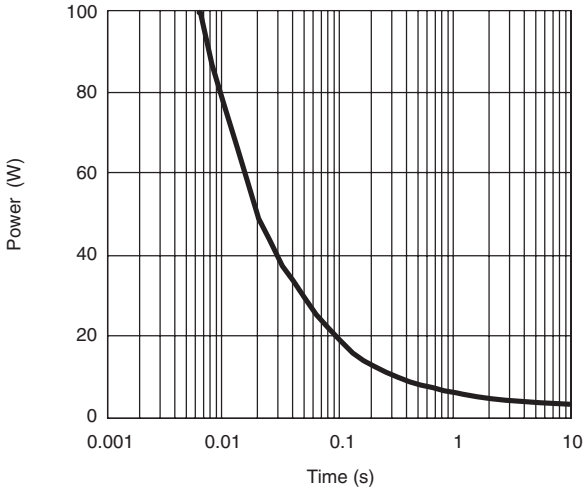
Source-Drain Diode Forward Voltage



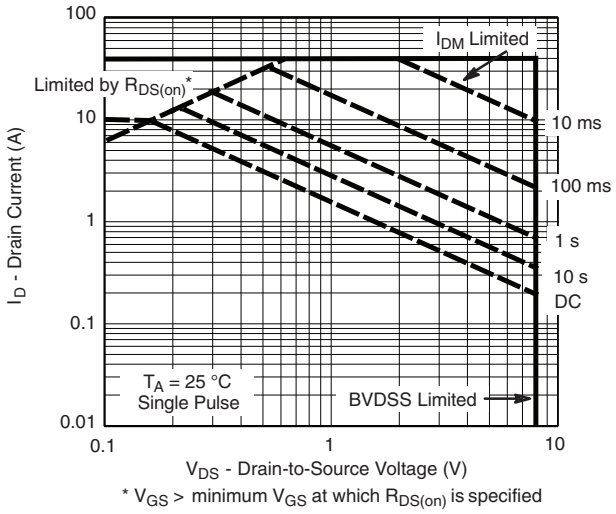
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



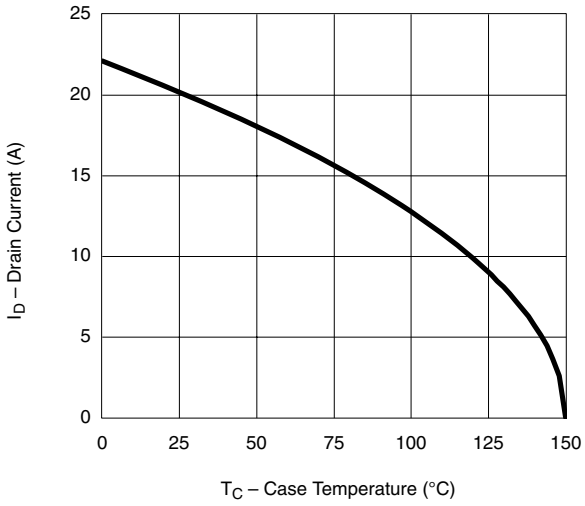
Single Pulse Power, Junction-to-Ambient



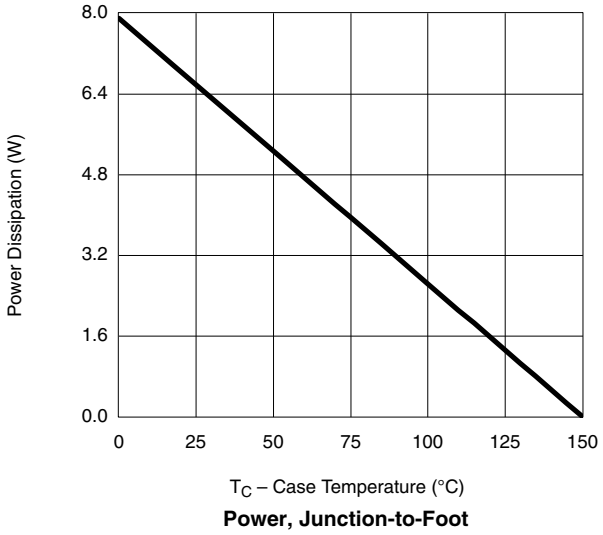
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operatin Area

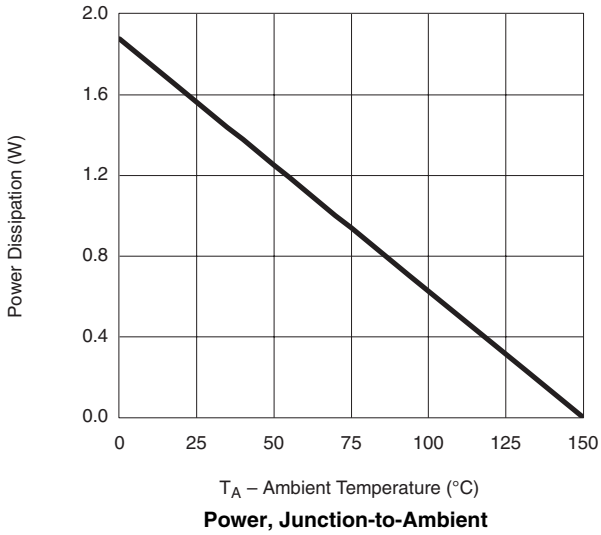
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Current Derating



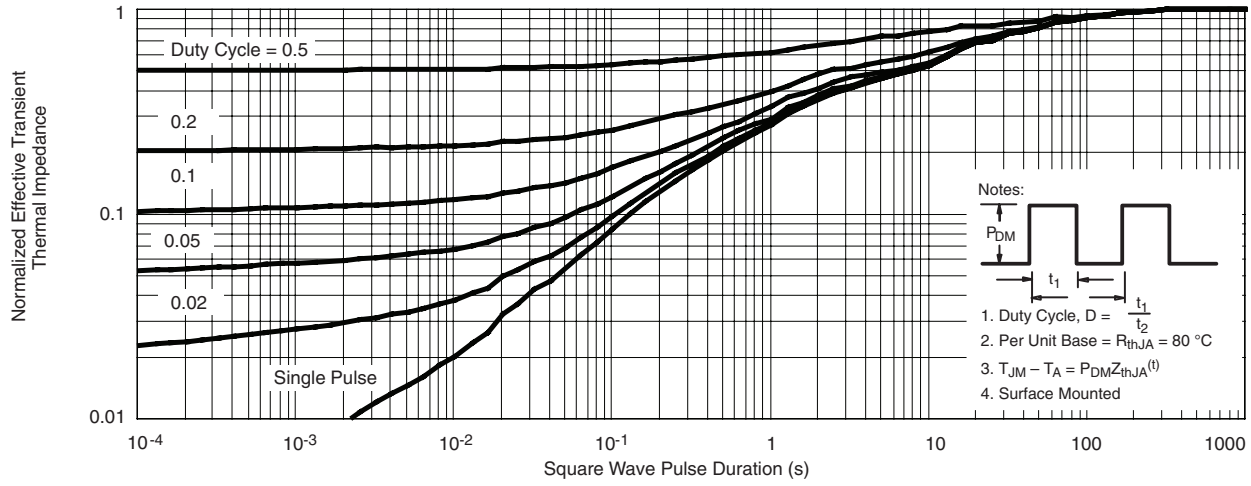
Power, Junction-to-Foot



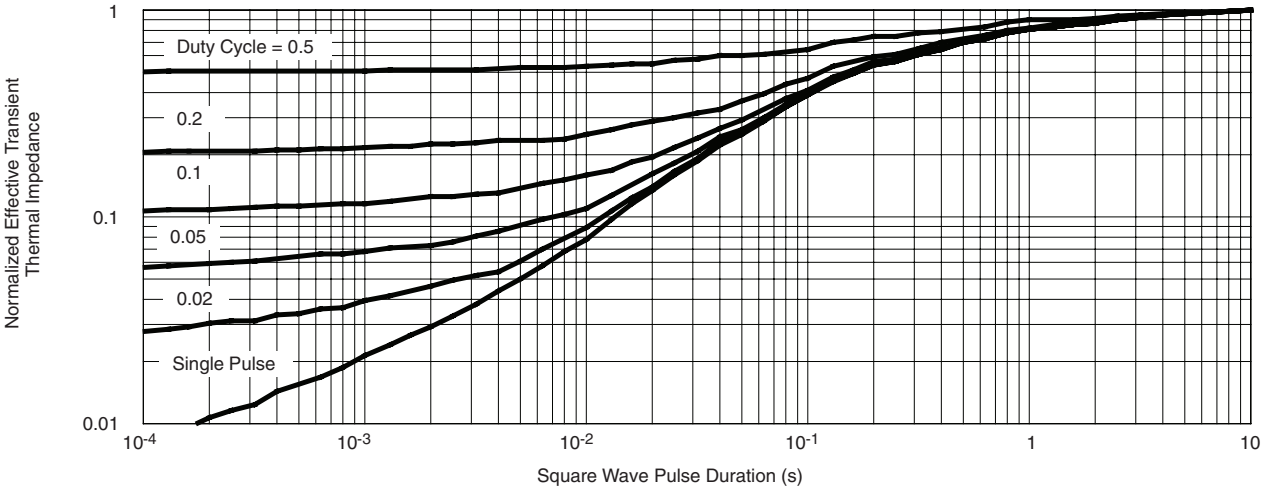
Power, Junction-to-Ambient

* 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.

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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