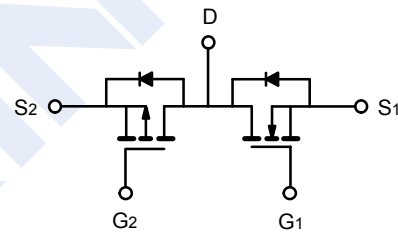
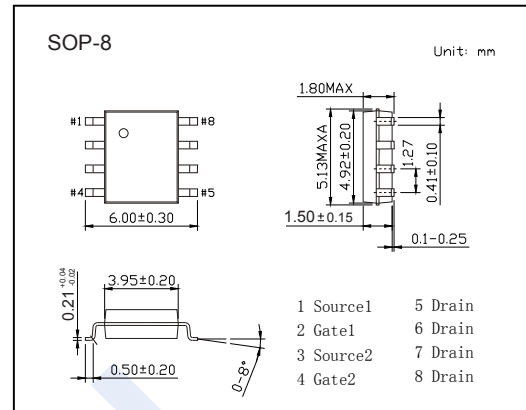


Complementary Power Trench MOSFET

SI4558DY (KI4558DY)

■ Features

- N-Channel: $V_{DS}=30V$ $I_D=6A$
- $R_{DS(ON)} < 40m\Omega$ ($V_{GS} = 10V$)
- $R_{DS(ON)} < 60m\Omega$ ($V_{GS} = 4.5V$)
- P-Channel: $V_{DS}=-30V$ $I_D=-6A$
- $R_{DS(ON)} < 40m\Omega$ ($V_{GS} = -10V$)
- $R_{DS(ON)} < 70m\Omega$ ($V_{GS} = -4.5V$)



■ Absolute Maximum Ratings $T_a = 25^\circ C$

Parameter	Symbol	N-Channel	P-Channel	Unit	
Drain-Source Voltage	V_{DS}	30	-30	V	
Gate-Source Voltage	V_{GS}	± 20			
Continuous Drain Current @ $T_J=150^\circ C$ (Note.1)	I_D	$T_a = 25^\circ C$	6	-6	A
		$T_a = 70^\circ C$	4.7	-4.7	
Pulsed Drain Current	I_{DM}	30	-30		
Power Dissipation	P_D	$T_a = 25^\circ C$	2.4		W
		$T_a = 70^\circ C$	1.5		
Thermal Resistance.Junction- to-Ambient (Note.1)	R_{thJA}	52		$^\circ C/W$	
Junction Temperature	T_J	150		$^\circ C$	
Storage Temperature Range	T_{stg}	-55 to 150			

Note.1:Surface Mounted on FR4 Board, $t \leq 10$ sec.

■ Marking

Marking	4558 KA****
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Complementary Power Trench MOSFET

SI4558DY (KI4558DY)

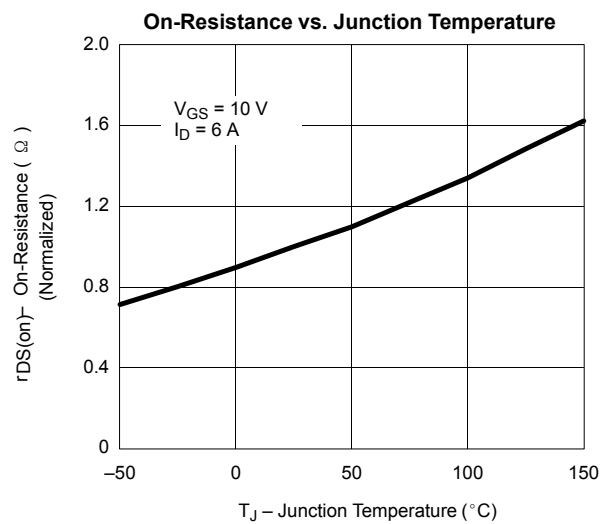
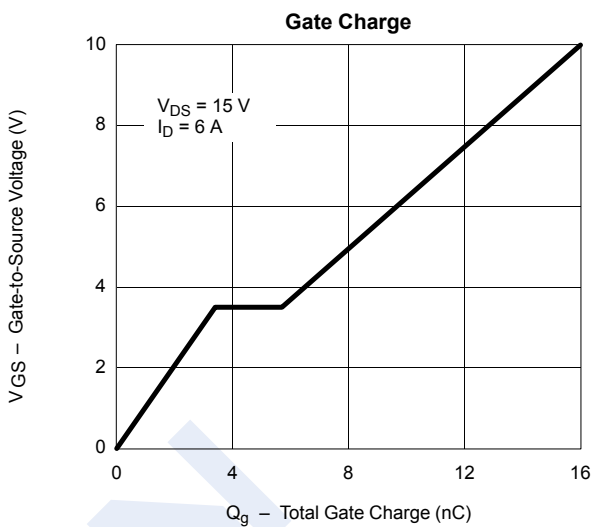
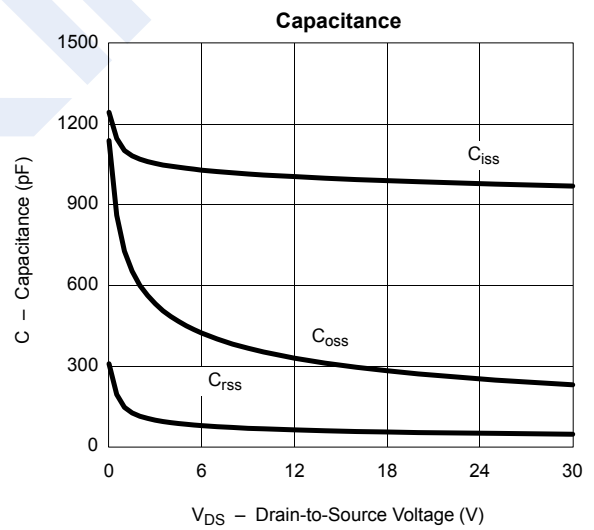
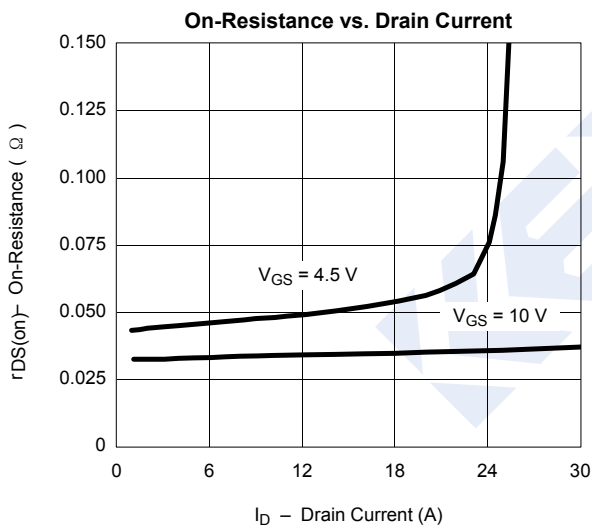
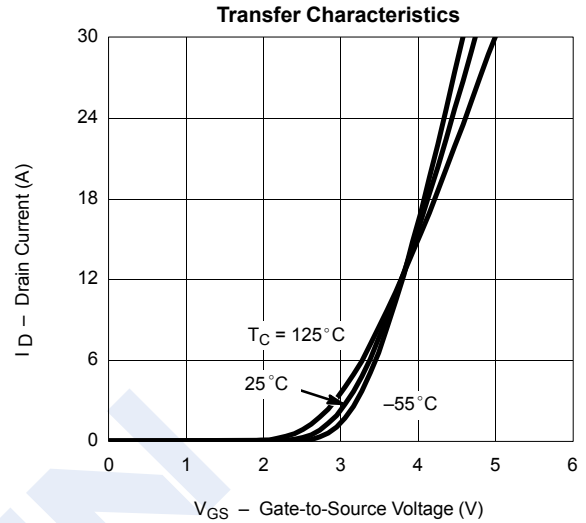
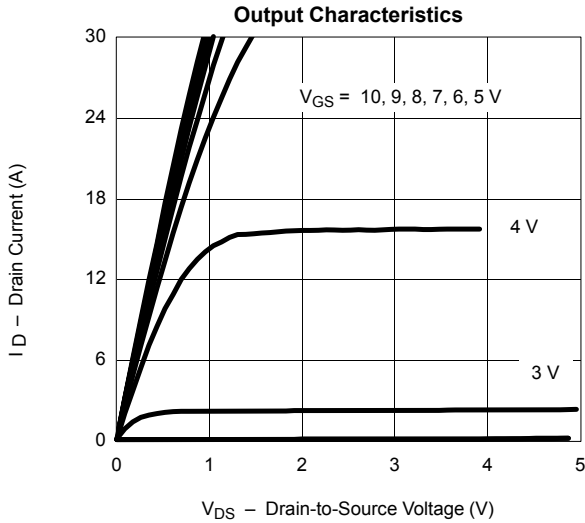
■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Type	Min	Typ	Max	Unit	
Drain-Source Breakdown Voltage	V _{DSS}	I _D =250 μA, V _{GS} =0V	N-CH	30			V	
		I _D =-250 μA, V _{GS} =0V	P-CH	-30				
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	N-CH			1	μA	
		V _{DS} =-30V, V _{GS} =0V	P-CH			-1		
		V _{DS} =24V, V _{GS} =0V, T _J =70°C	N-CH			5		
		V _{DS} =-24V, V _{GS} =0V, T _J =70°C	P-CH			-5		
Gate-Body Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V				±100	nA	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250 μA	N-CH	1			V	
		V _{DS} =V _{GS} , I _D =-250 μA	P-CH	-1				
Static Drain-Source On-Resistance (Note.1)	R _{DS(on)}	V _{GS} =10V, I _D =6A	N-CH		32	40	mΩ	
		V _{GS} =4.5V, I _D =4.8A			45	60		
		V _{GS} =-10V, I _D =-6A	P-CH		32	40		
		V _{GS} =-4.5V, I _D =-4.4A			56	70		
On-State drain Current (Note.1)	I _{D(on)}	V _{DS} =5V, V _{GS} =10V	N-CH	30			A	
		V _{DS} =-5V, V _{GS} =-10V	P-CH	-30				
		V _{DS} =5V, V _{GS} =4.5V	N-CH	8				
		V _{DS} =-5V, V _{GS} =-4.5V	P-CH	-8				
Forward Transconductance (Note.1)	g _{FS}	V _{DS} =15V, I _D =6A	N-CH		13		S	
		V _{DS} =-15V, I _D =-6A	P-CH		10.6			
Total Gate Charge	Q _g	N-Channel: V _{GS} =10V, V _{DS} =15V, I _D =6A	N-CH		16	30	nC	
Gate Source Charge	Q _{gs}		P-Channel: V _{GS} =-10V, V _{DS} =-15V, I _D =-6A	P-CH		22		35
		Gate Drain Charge	Q _{gd}	N-Channel: V _{GS} =10V, V _{DS} =15V, I _D =6A	N-CH			3.4
P-Channel: V _{GS} =-10V, V _{DS} =-15V, I _D =-6A	P-CH				5.4			
Turn-On DelayTime	t _{d(on)}	N-Channel: V _{GS} =10V, V _{DS} =15V, I _D =1A, R _G =6Ω	N-CH		12	25		ns
			P-CH		12	25		
Turn-On Rise Time	t _r	P-Channel: V _{GS} =-10V, V _{DS} =-15V, I _D =-1A, R _G =6Ω	N-CH		12	25		
			P-CH		12	25		
Turn-Off DelayTime	t _{d(off)}	N-Channel: R _L =15Ω	N-CH		27	55		
			P-CH		38	55		
Turn-Off Fall Time	t _f	P-Channel: R _L =15Ω	N-CH		24	50		
			P-CH		25	50		
Body Diode Reverse Recovery Time	t _{rr}	I _F =2A, di/dt=100A/μs	N-CH		45	80		
		I _F =-2A, di/dt=100A/μs	P-CH		50	80		
Maximum Body-Diode Continuous Current	I _S		N-CH			2	A	
			P-CH			-2		
Diode Forward Voltage (Note.1)	V _{SD}	I _S =2A, V _{GS} =0V	N-CH		0.77	1.2	V	
		I _S =-2A, V _{GS} =0V	P-CH		-0.77	-1.2		

Note.1: Pulse test; pulse width ≤ 300 us, duty cycle ≤ 2%.

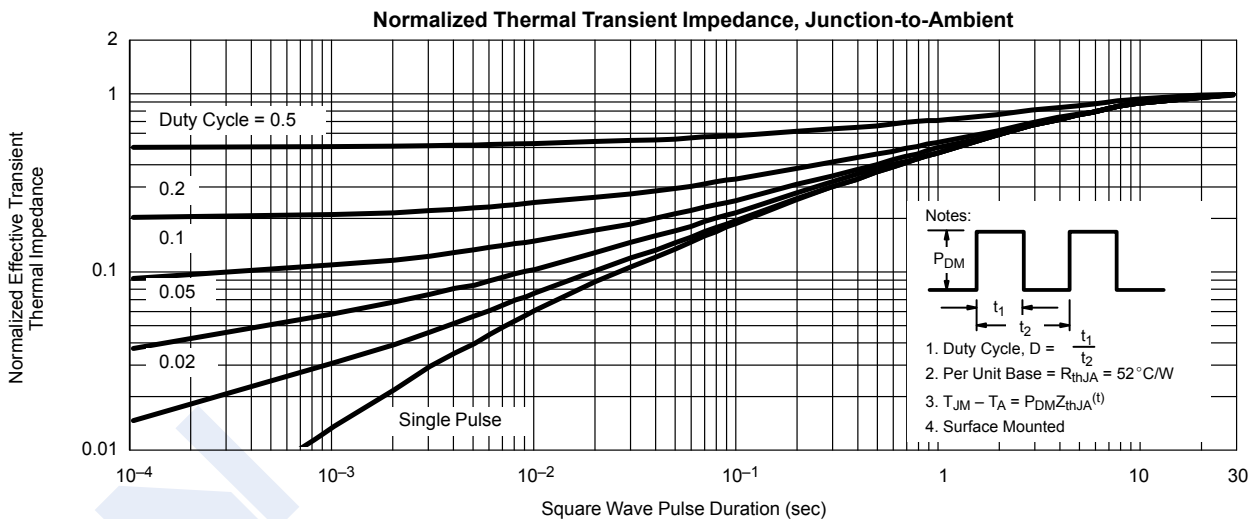
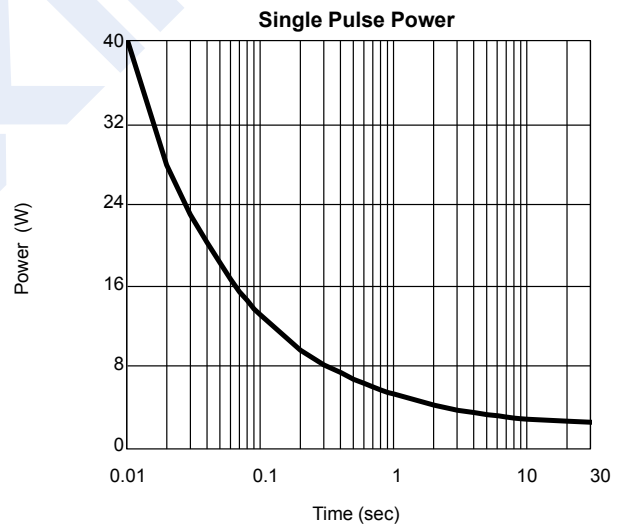
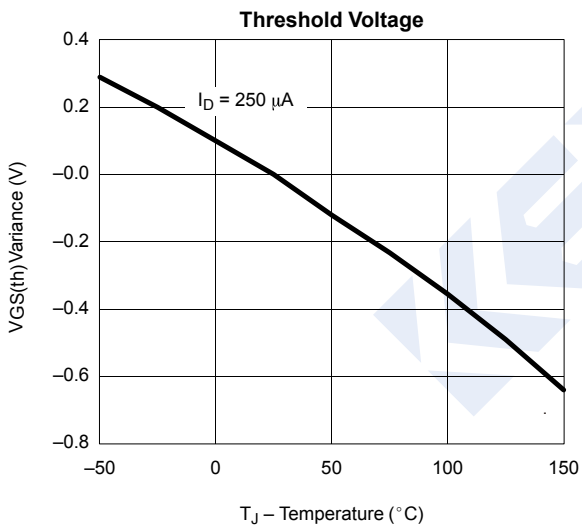
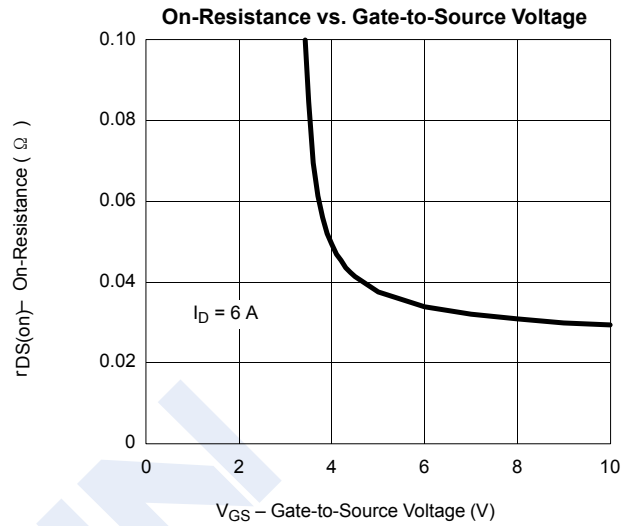
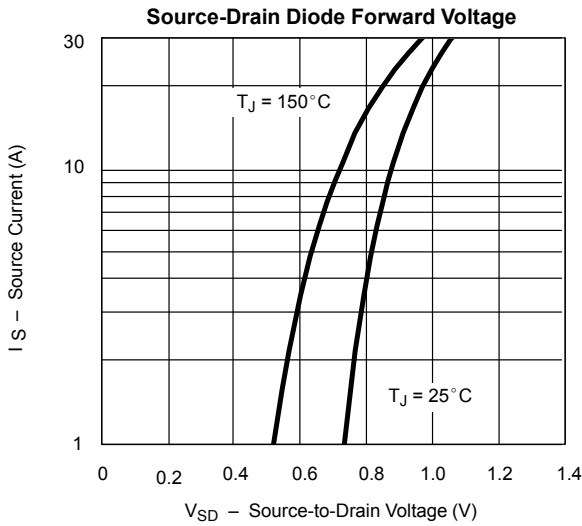
Complementary Power Trench MOSFET SI4558DY (KI4558DY)

■ N-MOSFET Typical Characteristics



Complementary Power Trench MOSFET SI4558DY (KI4558DY)

■ N-MOSFET Typical Characteristics

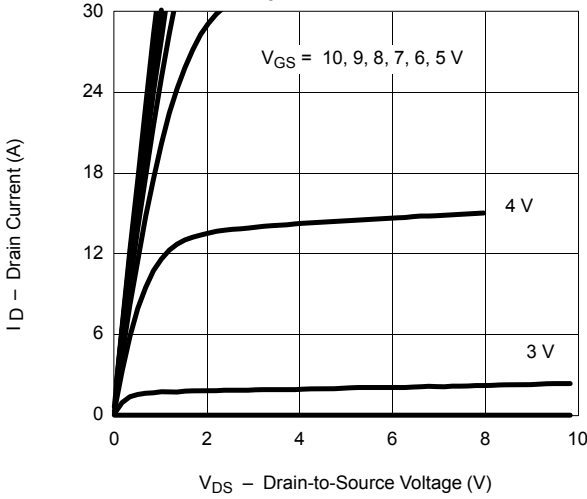


Complementary Power Trench MOSFET

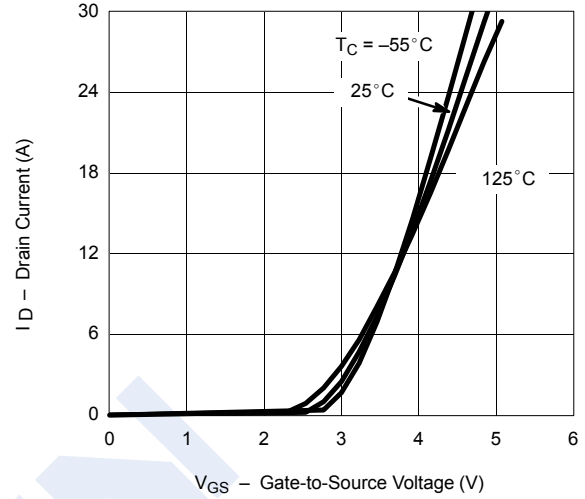
SI4558DY (KI4558DY)

■ P-MOSFET Typical Characteristics

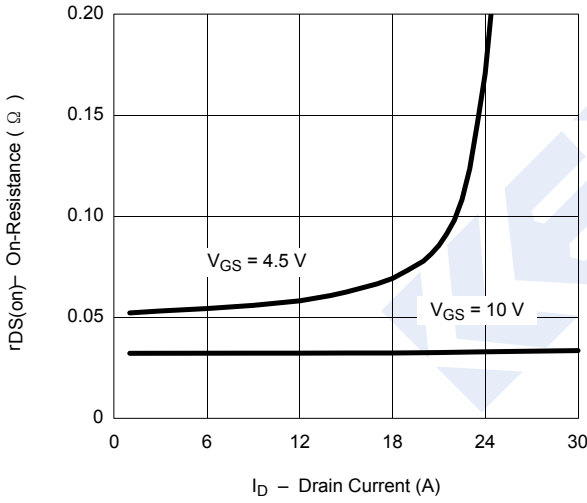
Output Characteristics



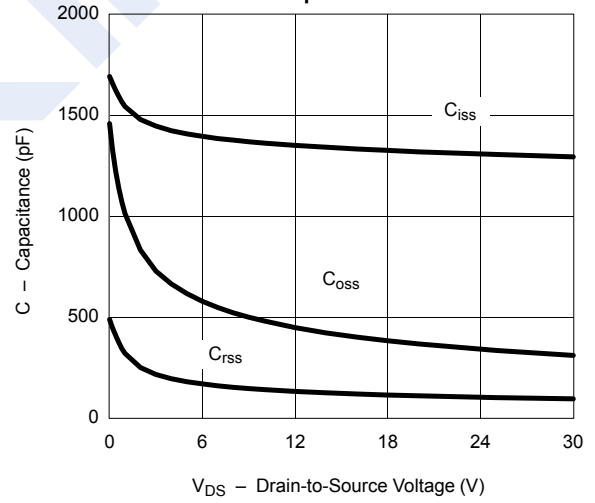
Transfer Characteristics



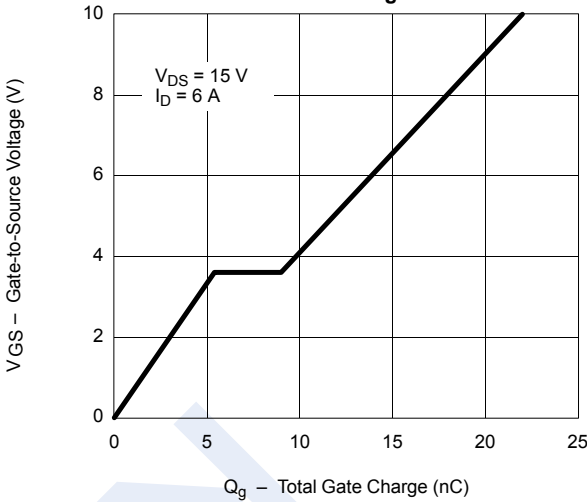
On-Resistance vs. Drain Current



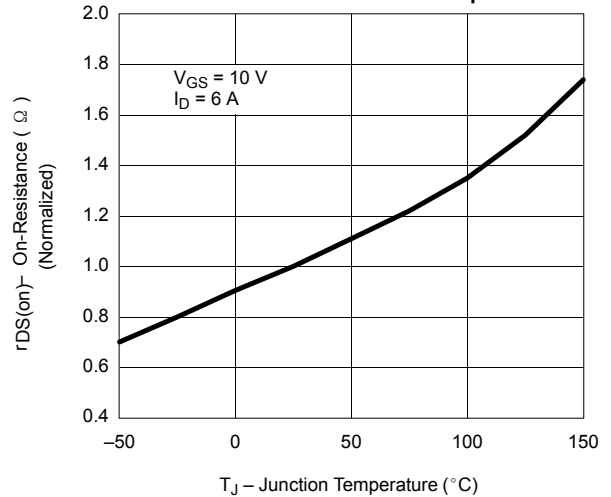
Capacitance



Gate Charge



On-Resistance vs. Junction Temperature



Complementary Power Trench MOSFET

SI4558DY (KI4558DY)

■ P-MOSFET Typical Characteristics

