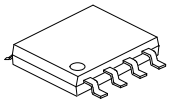
UD4446

Power MOSFET

15A, 30V N-CHANNEL POWER MOSFET



SOP-8

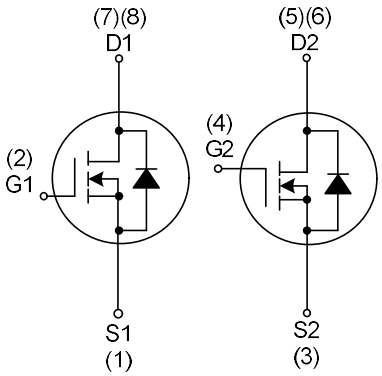
■ DESCRIPTION

The **UD4446** uses UTC advanced technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for being used in such applications: high-Side DC/DC Conversion, notebook and sever.

■ FEATURES

* $R_{DS(ON)}$ ≤ 14 mΩ @ V_{GS}=10V, I_D=7.5A
  $R_{DS(ON)}$ ≤ 18 mΩ @ V_{GS}=4.5V, I_D=7.5A
* High Density Cell Design for Ultra Low On-resistance

■ SYMBOL



■ ORDERING INFORMATION

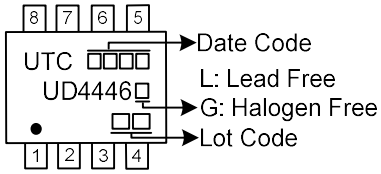
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UD4446L-S08-R	UD4446G-S08-R	SOP-8	S1	G1	S2	G2	D2	D2	D1	D1	Tape Reel

UD4446G-S08-R
(1)Packing Type
(2)Package Type
(3)Green Package

(1) R: Tape Reel
(2) S08: SOP-8
(3) G: Halogen Free and Lead Free, L: Lead Free

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■ MARKING


8 7 6 5
UTC
UD4446
1 2 3 4
Date Code
L: Lead Free
G: Halogen Free
Lot Code

■ ABSOLUTE MAXIMUM RATINGS (T_A = 25°C, unless otherwise specified.)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	Continuous	I_D	15	A
	Pulsed (Note 2)	I_{DM}	40	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	8.5	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	2	V/ns
Power Dissipation		P_D	1.6	W
Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. L = 0.1mH, I_{AS} = 13A, V_{DD} = 25V, R_G = 25Ω, Starting T_J = 25°C.
4. I_{SD} ≤ 15A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	90	°C/W
Junction to Case	θ_{JC}	78	°C/W

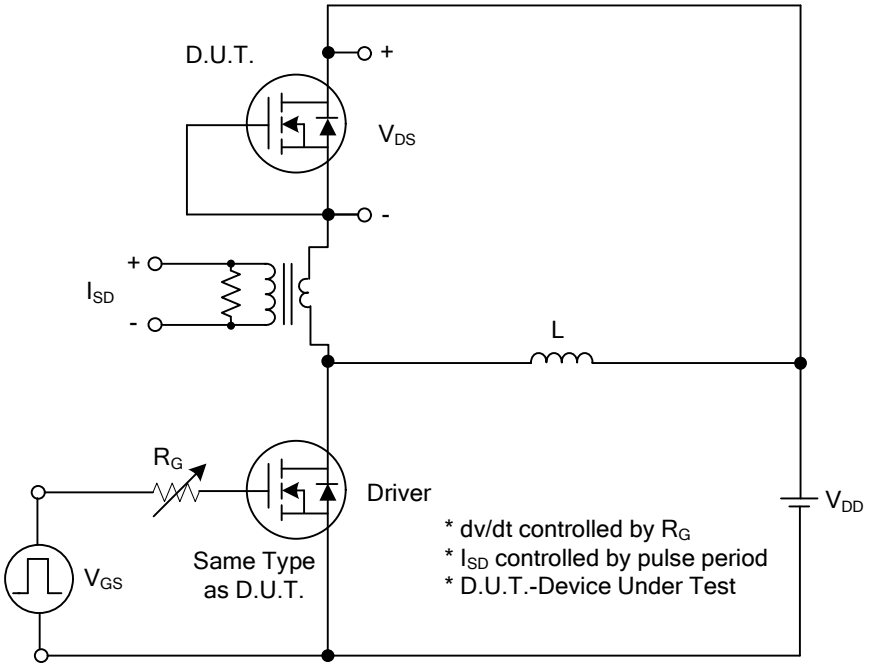
Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

■ ELECTRICAL CHARACTERISTICS (T_J = 25°C, unless otherwise specified.)

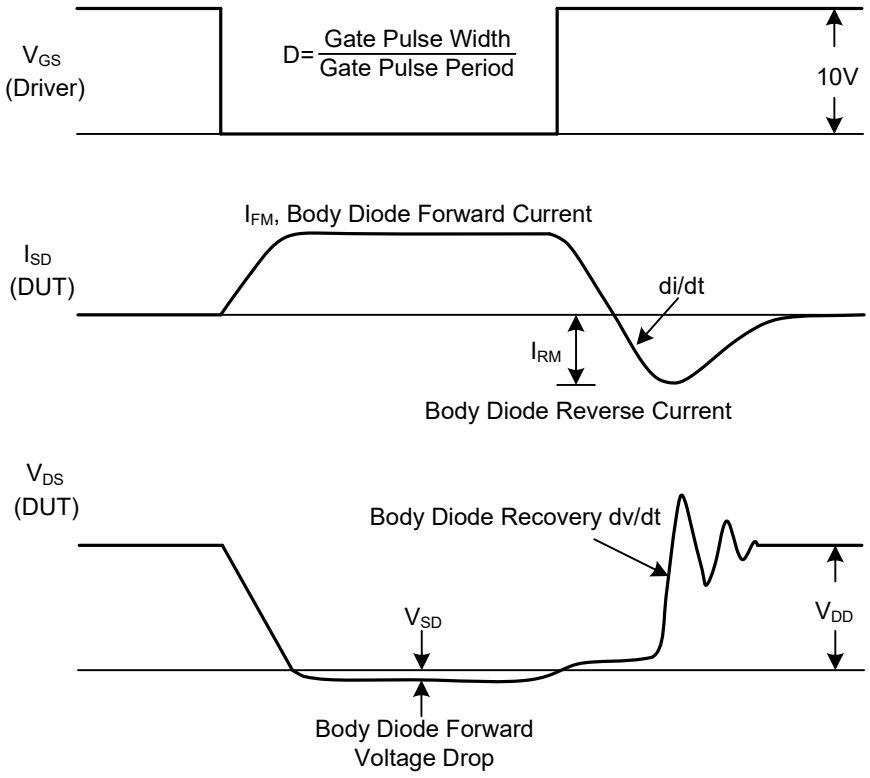
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=10mA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	uA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250uA	1.0		3.0	V
Drain-Source On-State Resistance (Note2)	$R_{DS(ON)}$	V_{GS}=10V, I_D=7.5A			14	mΩ
		V_{GS}=4.5V, I_D=7.5A			18	mΩ
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{GS}=0V,V_{DS}=15V,f=1.0MHz		702		pF
Output Capacitance	C_{OSS}			190		pF
Reverse Transfer Capacitance	C_{RSS}			161		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge (Note2)	Q_G	V_{DS}=24V, V_{GS}=10V, I_D=15A		31		nC
Gate-Source Charge	Q_{GS}			6		nC
Gate-Drain Charge	Q_{GD}			8		nC
Turn-ON Delay Time (Note2)	$t_{D(ON)}$	V_{DS}=15V, V_{GS}=10V, R_G=3Ω, I_D=15A		13		ns
Turn-ON Rise Time	t_R			22		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			37		ns
Turn-OFF Fall Time	t_F			54		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Continuous Forward Current	I_S				15	A
Drain-Source Diode Forward Voltage(Note2)	V_{SD}	I_S=15A, V_{GS}=0V			1	V
Reverse Recovery Time	t_{rr}	I_{DS}=15A, dI/dt=100A/μs		638		ns
Reverse Recovery Charge	Q_{rr}			1594		nC

Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

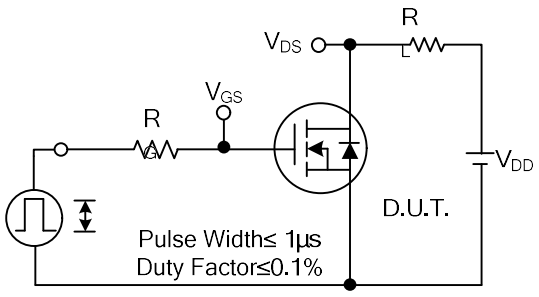


Peak Diode Recovery dv/dt Test Circuit

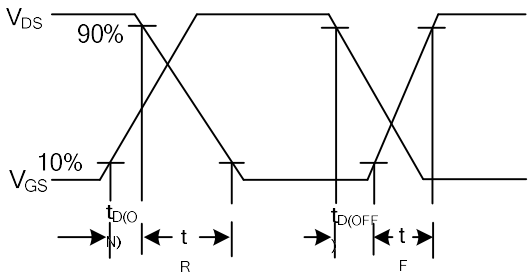


Peak Diode Recovery dv/dt Waveforms

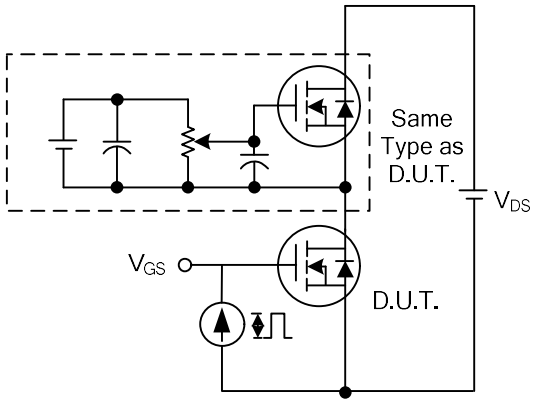
■ TEST CIRCUITS AND WAVEFORMS



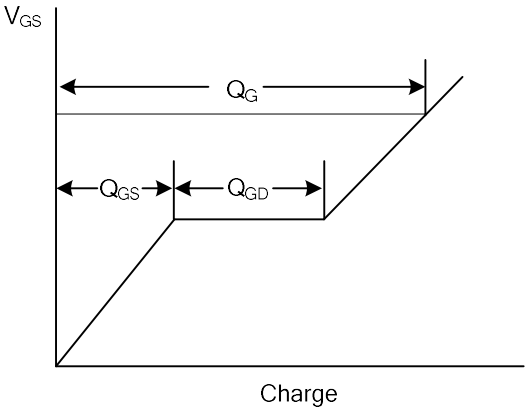
Switching Test Circuit



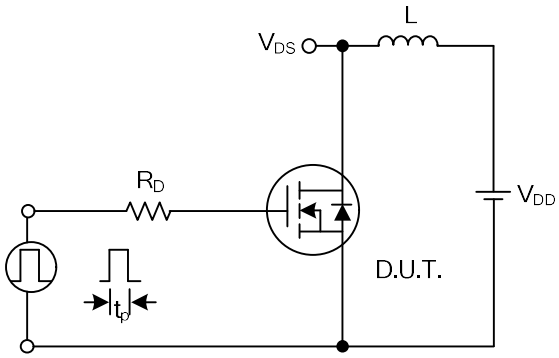
Switching Waveforms



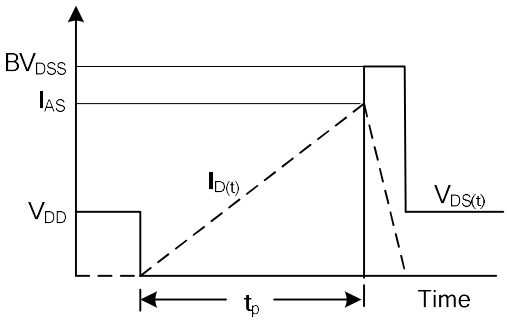
Gate Charge Test Circuit



Gate Charge Waveform



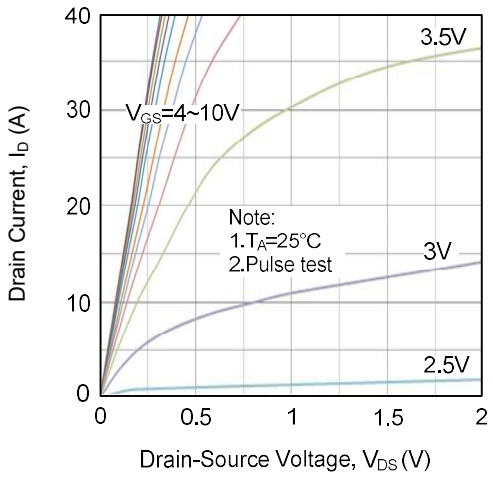
Unclamped Inductive Switching Test Circuit



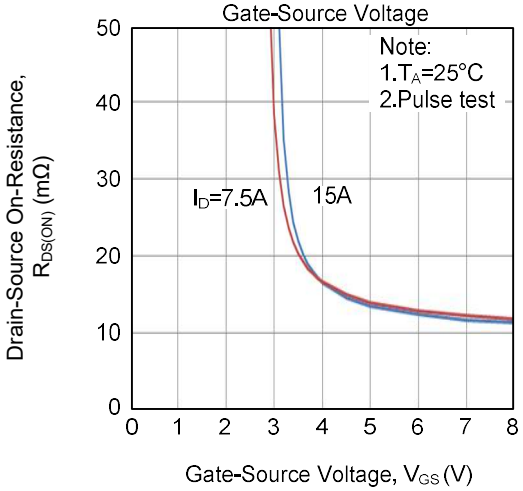
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

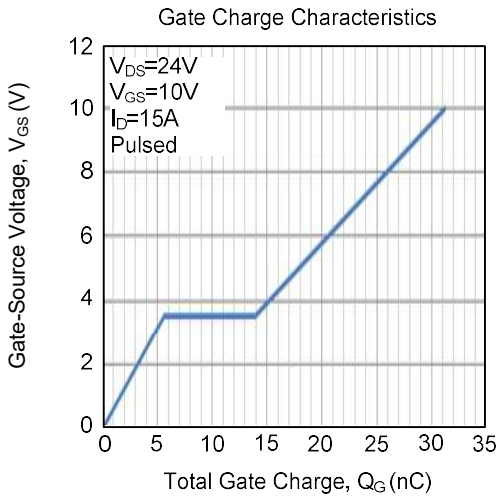
Drain Current vs. Drain-Source Voltage



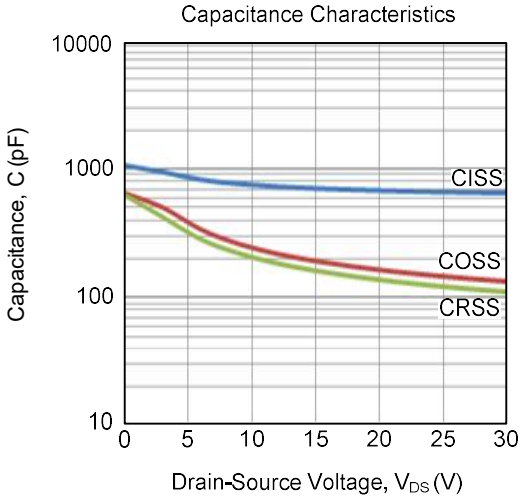
Drain-Source On-Resistance vs. Gate-Source Voltage



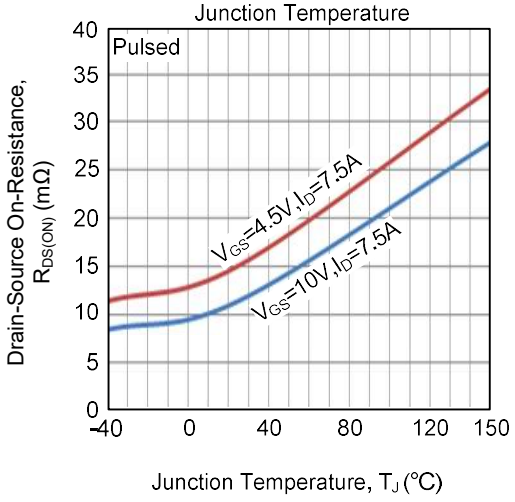
Gate Charge Characteristics



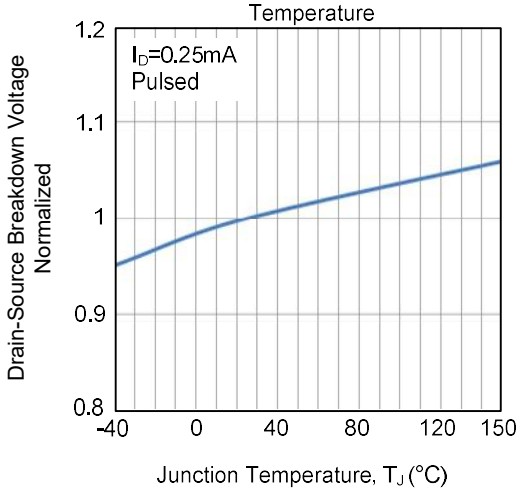
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

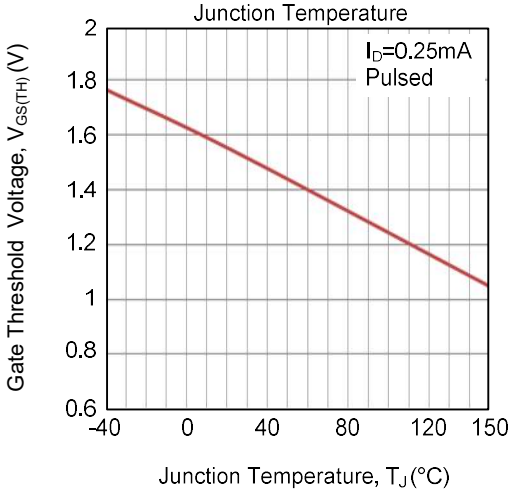


Breakdown Voltage vs. Junction Temperature

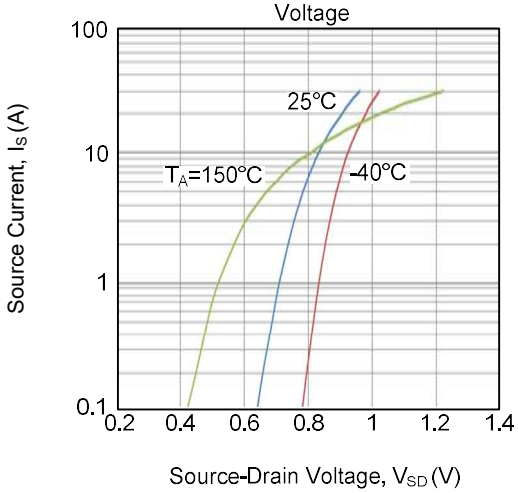


■ TYPICAL CHARACTERISTICS (Cont.)

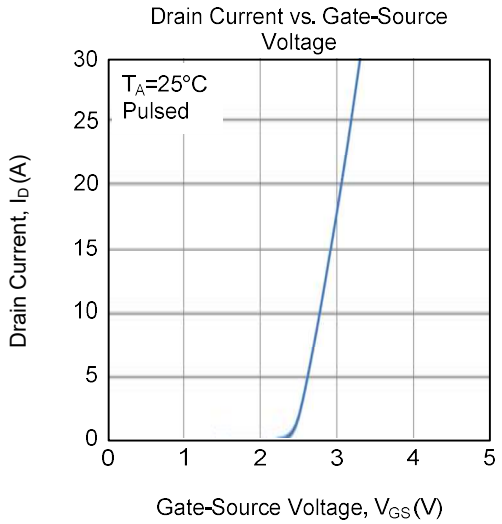
Gate Threshold Voltage vs. Junction Temperature



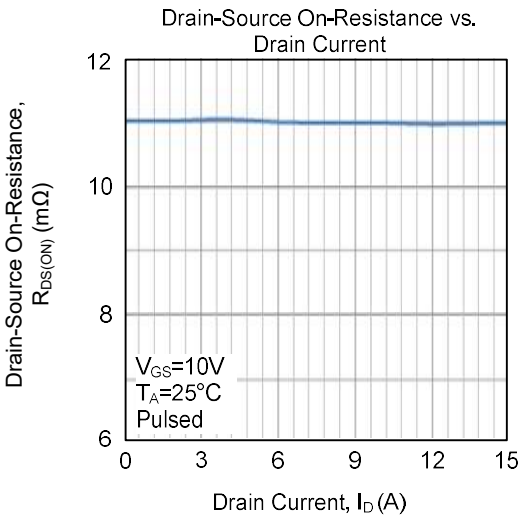
Source Current vs. Source-Drain Voltage



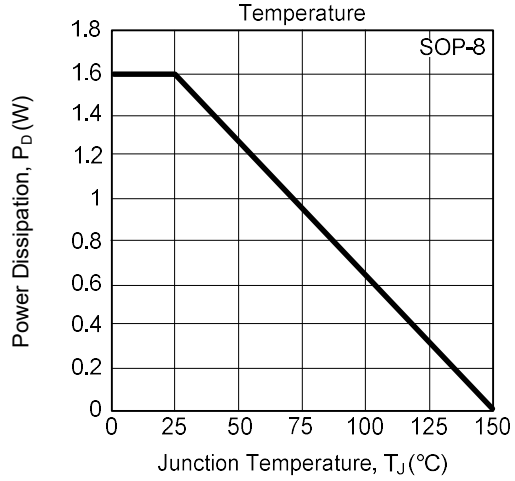
Drain Current vs. Gate-Source Voltage



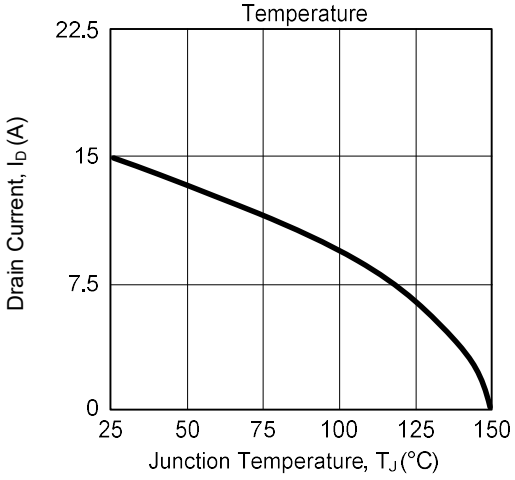
Drain-Source On-Resistance vs. Drain Current



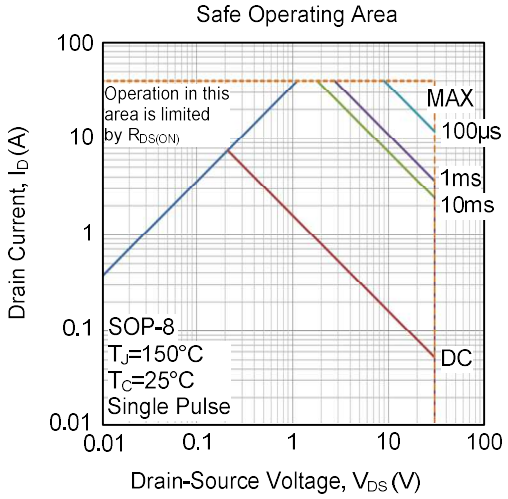
Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)



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