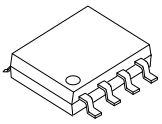
UT6898

Power MOSFET

N-CHANNEL ENHANCEMENT



SOP-8

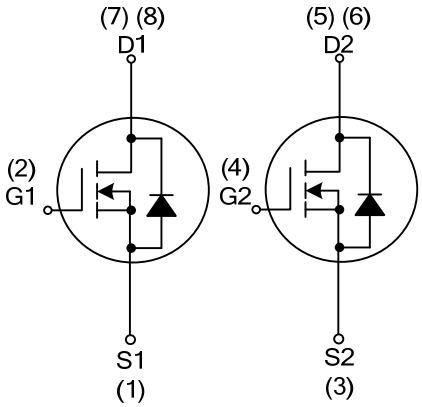
■ DESCRIPTION

The **UT6898** uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

■ FEATURES

* $R_{DS(ON)}$ ≤ 14 mΩ @ V_{GS}=4.5V, I_D=9.4A
* $R_{DS(ON)}$ ≤ 18 mΩ @ V_{GS}=2.5V, I_D=8.3A
* Low capacitance
* Low gate charge
* Fast switching capability
* Avalanche energy specified

■ SYMBOL



■ ORDERING INFORMATION

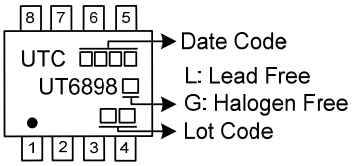
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT6898L-S08-R	UT6898G-S08-R	SOP-8	S1	G1	S2	G2	D2	D2	D1	D1	Tape Reel

Note: Pin Assignment: G: Gate D: Drain S: Source

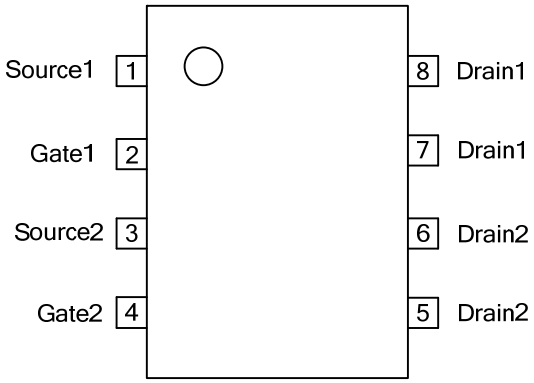
UT6898G-S08-R

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

■ MARKING



■ PIN CONFIGURATION



■ ABSOLUTE MAXIMUM RATING (T_C=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GSS}	±12	V
Continuous Drain Current	I_D	9.4	A
Pulsed Drain Current	I_{DM}	38	A
Maximum Power Dissipation	P_D	3.1 (Note)	W
Operating Junction and Storage Temperature Range	T_J, 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. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction-to-Case	θ_{JC}	40	°C/W

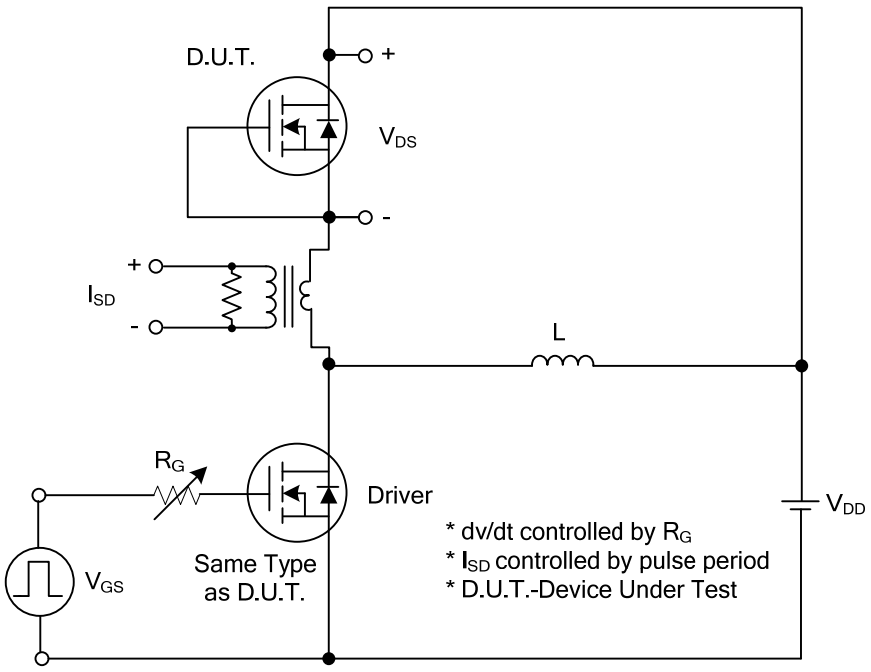
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

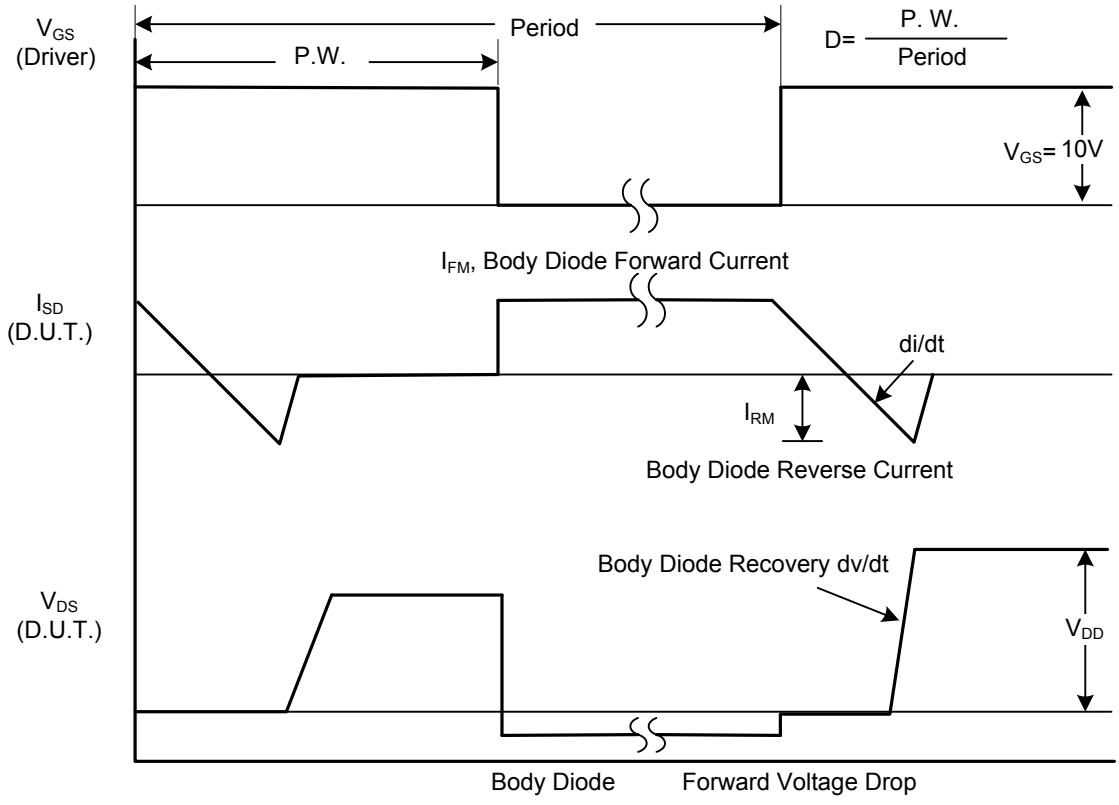
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	20			V
Drain-Source Leakage Current	I_{DSS}	V_{GS}=0V, V_{DS}=16V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V,			±100	nA
ON CHARACTERISTICS (Note 1)						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	0.5	1	1.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=9.4A		10	14	mΩ
		V_{GS}=2.5V, I_D=8.3A		13	18	
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=10V, f=1MHz		2100		pF
Output Capacitance	C_{OSS}			530		pF
Reverse Transfer Capacitance	C_{RSS}			450		pF
SWITCHING PARAMETERS (Note 1)						
Total Gate Charge	Q_G	V_{GS}=10V, V_{DS}=10V, I_D=9.4A		48		nC
Gate Source Charge	Q_{GS}			6.7		nC
Gate Drain Charge	Q_{GD}			1.6		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{GS}=10V,V_{DS}=10V, I_D=9.4A R_G=6Ω		7		ns
Turn-ON Rise Time	t_R			18		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			52		ns
Turn-OFF Fall-Time	t_F			24		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				2.6	A
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=9.4A (Note 1)			1.2	V

Notes: 1. Pulse Test: Pulse Width < 300ms, Duty Cycle < 2.0%
2. The diode connected between the gate and source serves only as protection against ESD. No gate overvoltage rating is implied

■ TEST CIRCUITS AND WAVEFORMS

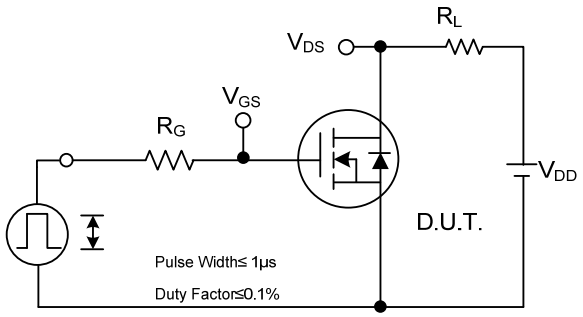


Peak Diode Recovery dv/dt Test Circuit

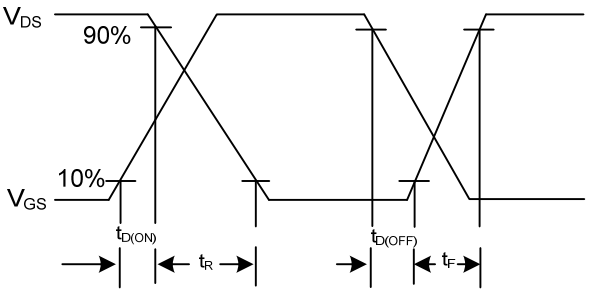


Peak Diode Recovery dv/dt Waveforms

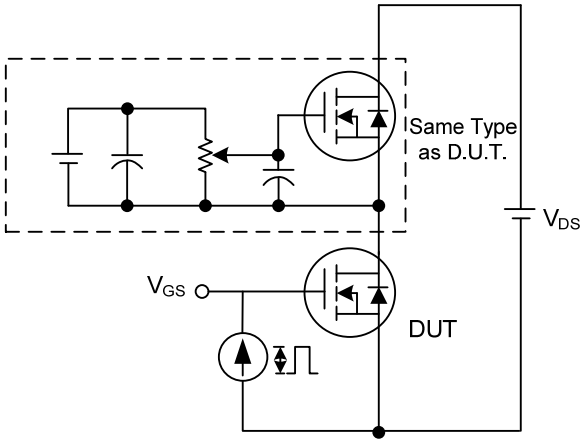
■ TEST CIRCUITS AND WAVEFORMS



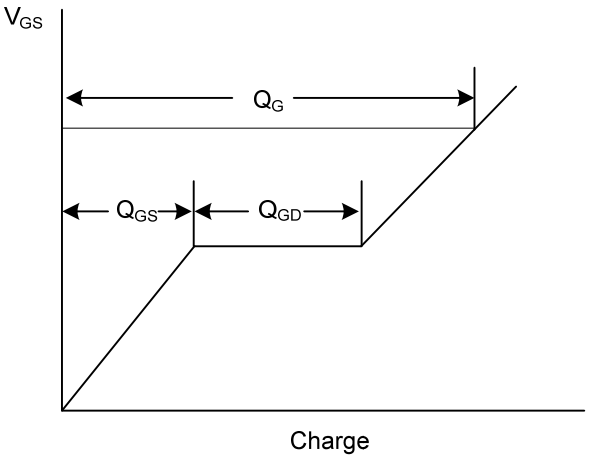
Switching Test Circuit



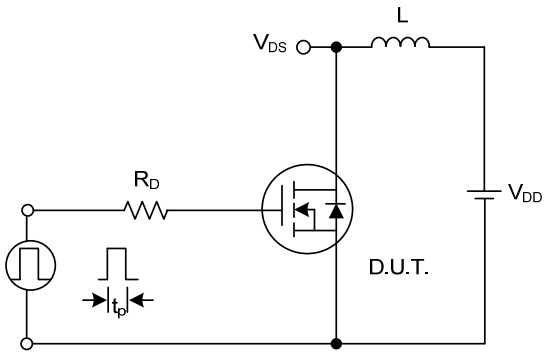
Switching Waveforms



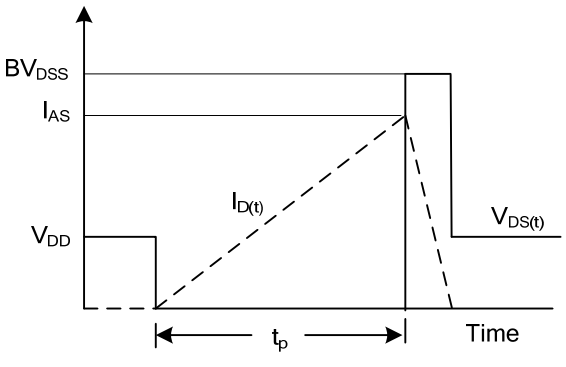
Gate Charge Test Circuit



Gate Charge Waveform



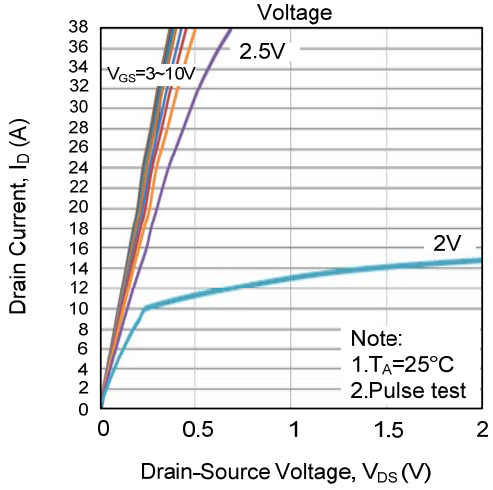
Unclamped Inductive Switching Test Circuit



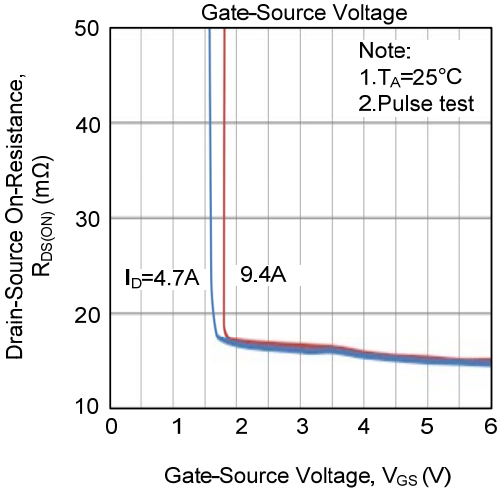
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

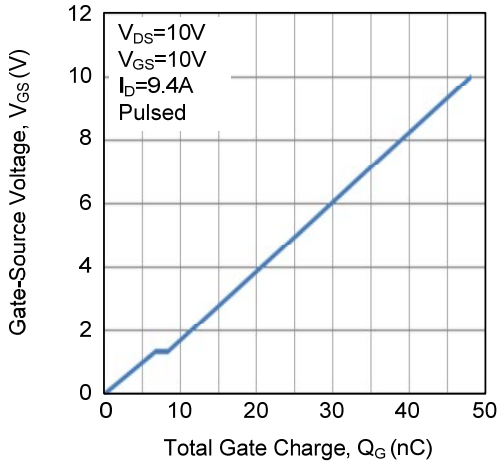
Drain Current vs. Drain-Source Voltage



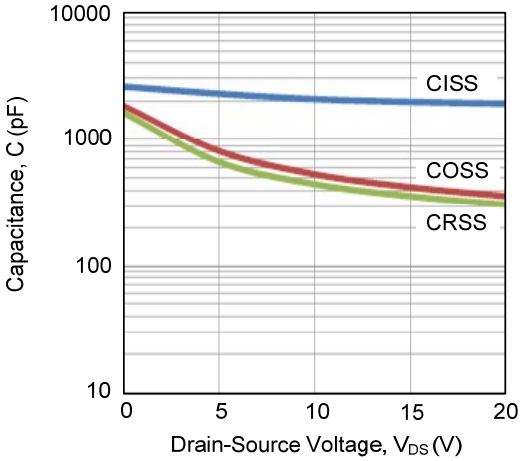
Drain-Source On-Resistance vs. Gate-Source Voltage



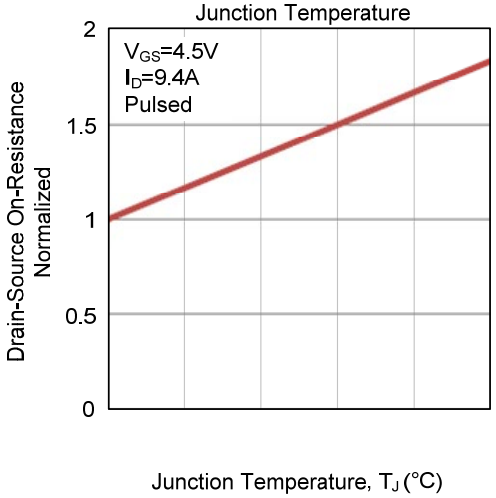
Gate Charge Characteristics



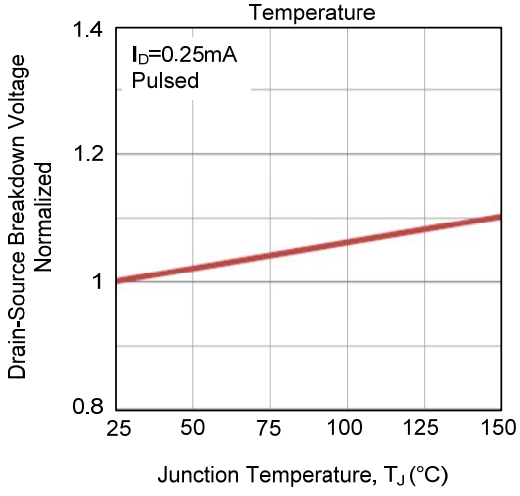
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

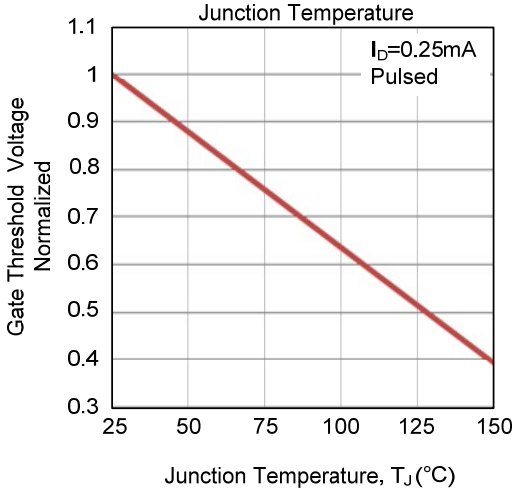


Breakdown Voltage vs. Junction Temperature

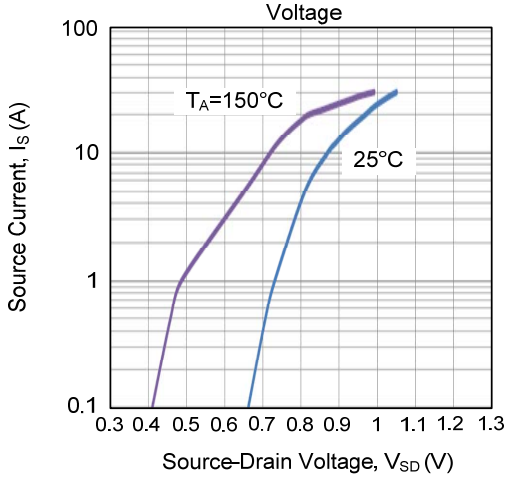


■ TYPICAL CHARACTERISTICS (Cont.)

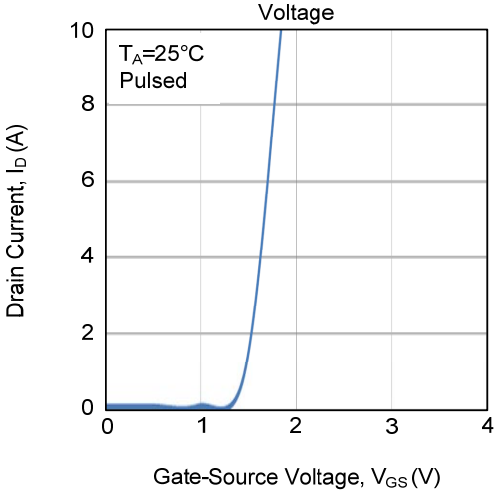
Gate Threshold Voltage vs. Junction Temperature



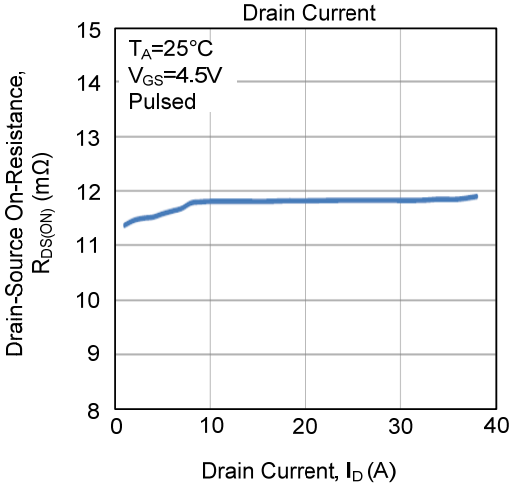
Source Current vs. Source-Drain Voltage



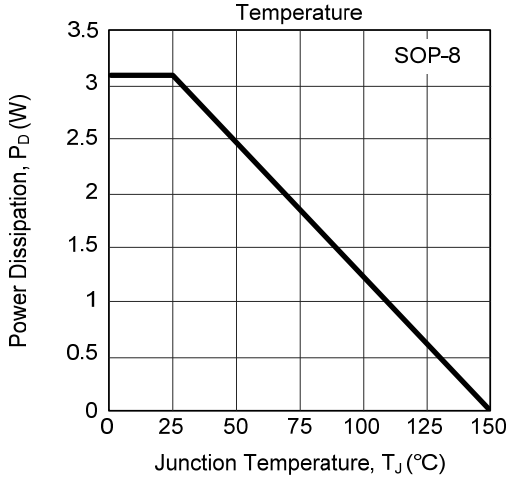
Drain Current vs. Gate-Source Voltage



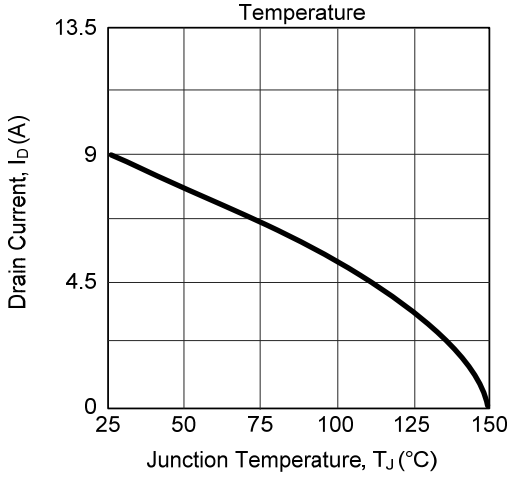
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)