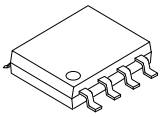
UT4411

Power MOSFET

P-CHANNEL ENHANCEMENT MODE



SOP-8

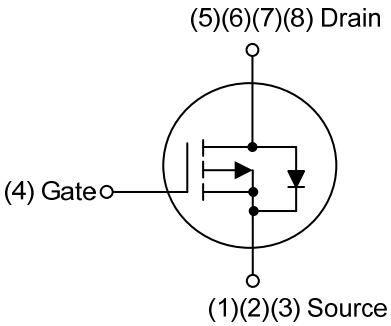
■ DESCRIPTION

The **UT4411** 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

* $R_{DS(ON)} \leq 32\ m\Omega$ @ $V_{GS} = -10V$, $I_D = -8.0A$
  $R_{DS(ON)} \leq 52\ m\Omega$ @ $V_{GS} = -4.5V$, $I_D = -5.0A$
* Low capacitance
* Optimized gate charge
* Fast switching capability
* Avalanche energy specified

■ SYMBOL



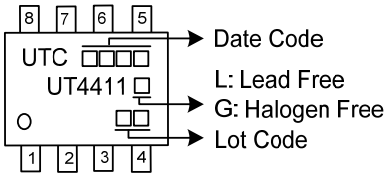
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT4411L-S08-R	UT4411G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

UT4411G-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

■ MARKING


8 7 6 5
UTC
UT4411
O
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
Continuous Drain Current	Continuous	I_D	-8	A
	Pulsed	I_{DM}	-36	A
Single Pulsed Avalanche Energy		E_{AS}	29	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	1.1	V/ns
Power Dissipation		P_D	1.7	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 = 1.0mH, I_{AS} = -7.6A, V_{DD} = -20V, R_G = 25Ω, Starting T_J = 25°C
4. I_{SD} ≤ -8.0A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	90	°C/W
Junction to Case	θ_{JC}	73	°C/W

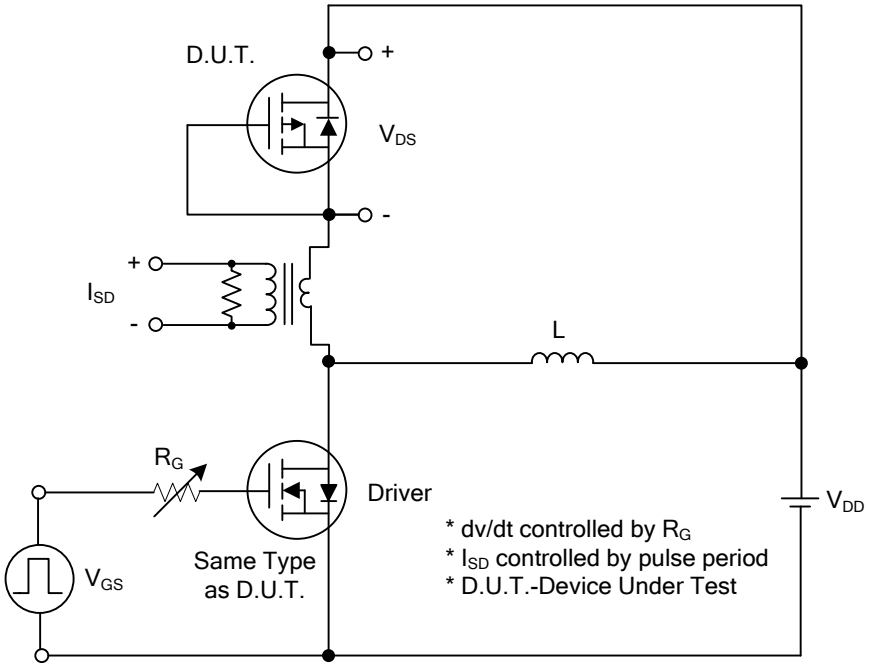
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

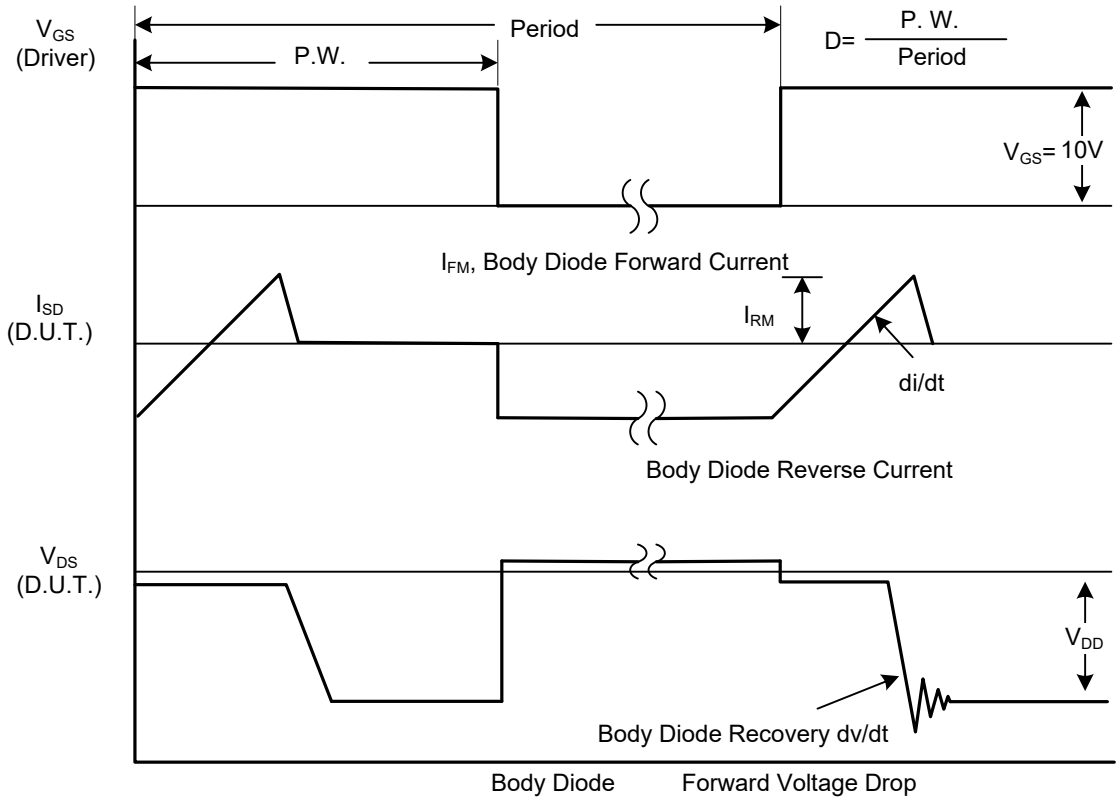
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-24V, V_{GS}=0V			-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS},I_D=-250μA	-1.0		-3.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V,I_D=-8.0A			32	mΩ
		V_{GS}=-4.5V,I_D=-5.0A			52	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS} =-15V, V_{GS} =0V, f=1MHz		1027		pF
Output Capacitance	C_{OSS}			182		pF
Reverse Transfer Capacitance	C_{RSS}			153		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS}=-24V, V_{GS}=-10V, I_D=-18A		26.5		nC
Gate Source Charge	Q_{GS}			3.1		nC
Gate Drain Charge	Q_{GD}			7.7		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{GS}=-15V, V_{DS}=-10V, I_D=-18A, R_G=3Ω		5		ns
Turn-ON Rise Time	t_R			18		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			25		ns
Turn-OFF Fall-Time	t_F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				-8.0	A
Diode Forward Voltage	V_{SD}	I_S=-1.0A, V_{GS}=0V			-1.0	V
Body Diode Reverse Recovery Time	t_{rr}	I_S=-18A, V_{GS}=0V, dI_F/dt=100A/μs		217		ns
Reverse Recovery Charge	Q_{rr}			0.56		μC

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse width ≤ 300us, duty cycle ≤ 0.5% max.
3. Surface mounted on 1 in ^{2} copper pad of FR4 board, t ≤10s.

■ TEST CIRCUITS AND WAVEFORMS

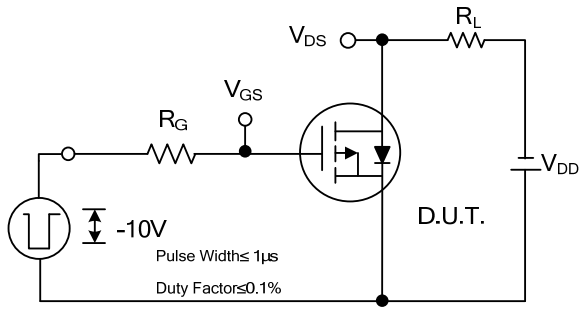


Peak Diode Recovery dv/dt Test Circuit

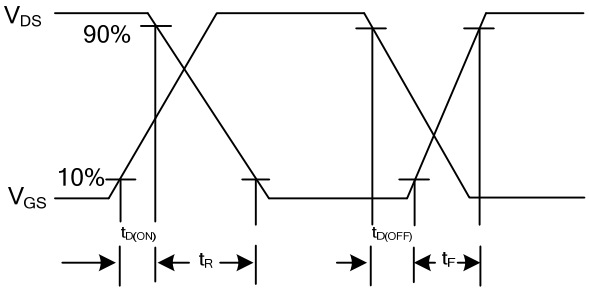


Peak Diode Recovery dv/dt Waveforms

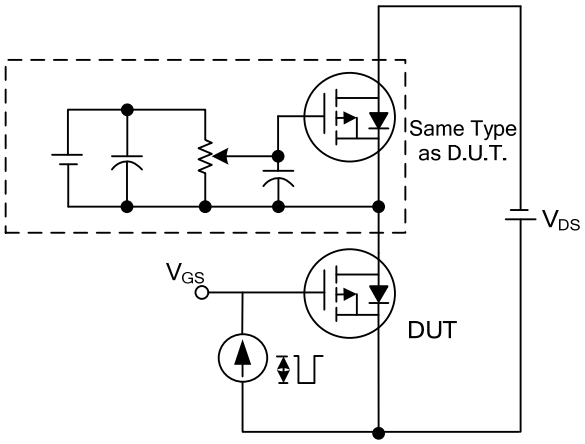
■ TEST CIRCUITS AND WAVEFORMS



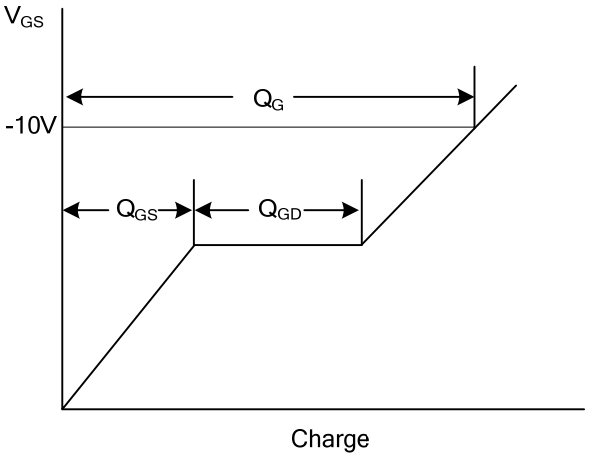
Switching Test Circuit



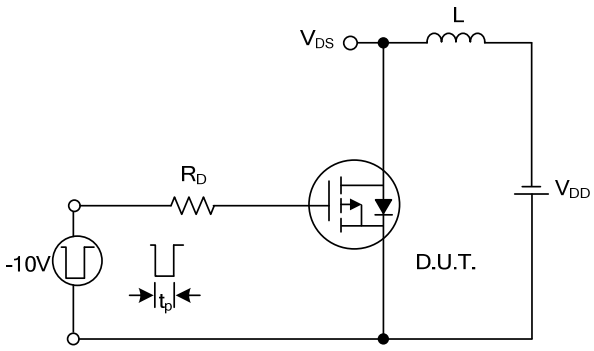
Switching Waveforms



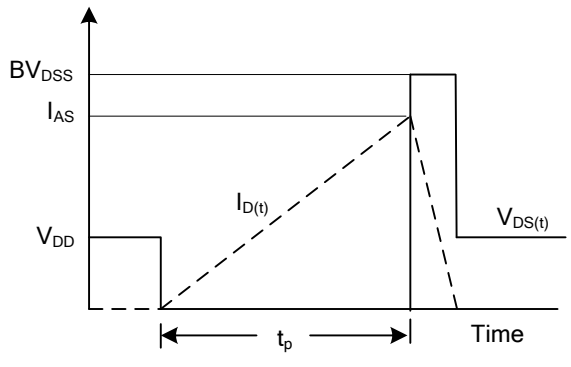
Gate Charge Test Circuit



Gate Charge Waveform



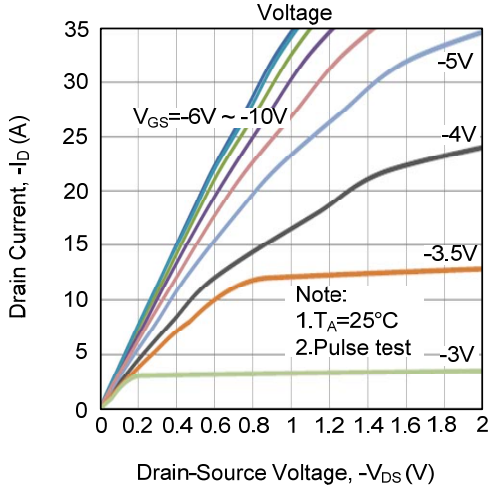
Unclamped Inductive Switching Test Circuit



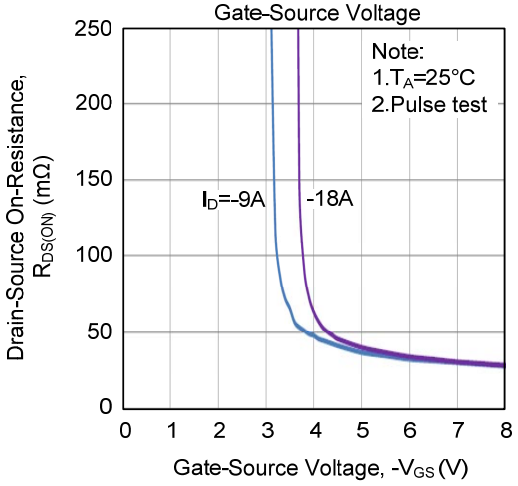
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

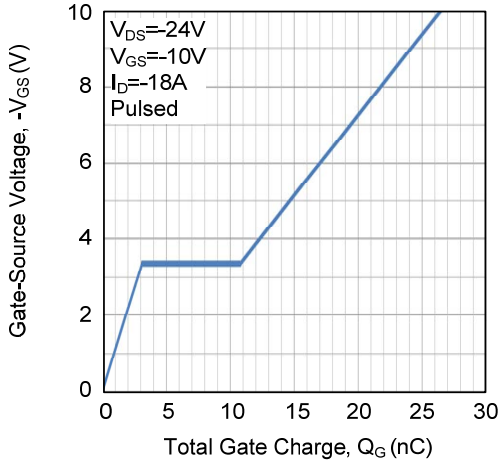
Drain Current vs. Drain-Source Voltage



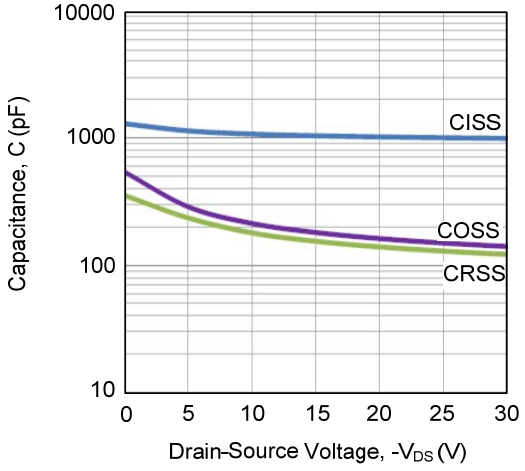
Drain-Source On-Resistance vs. Gate-Source Voltage



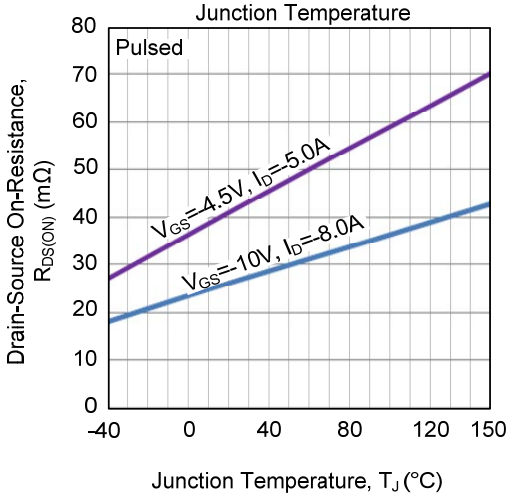
Gate Charge Characteristics



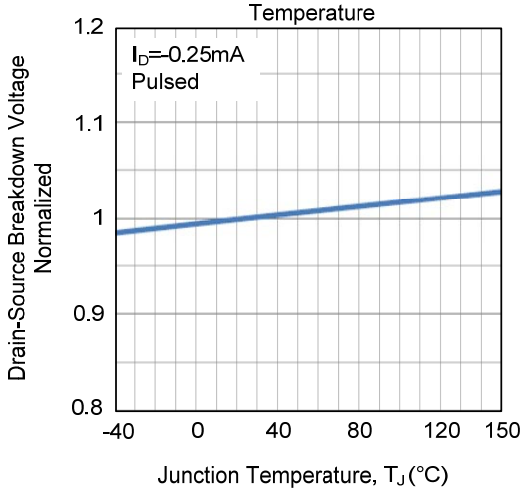
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

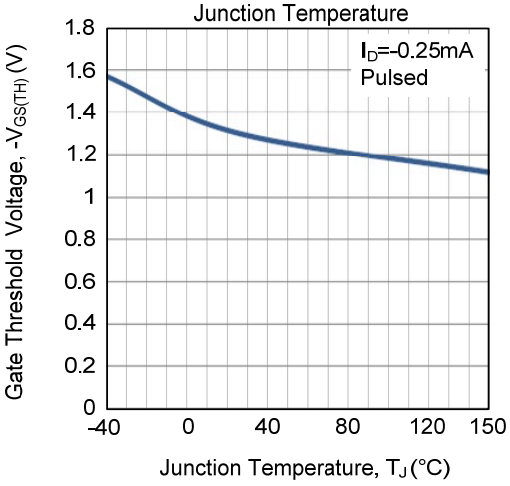


Breakdown Voltage vs. Junction Temperature

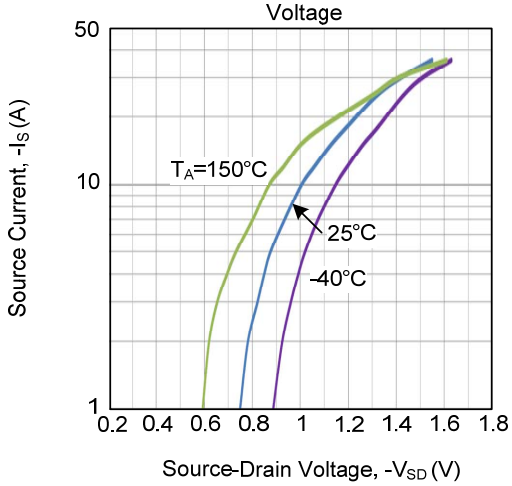


■ TYPICAL CHARACTERISTICS (Cont.)

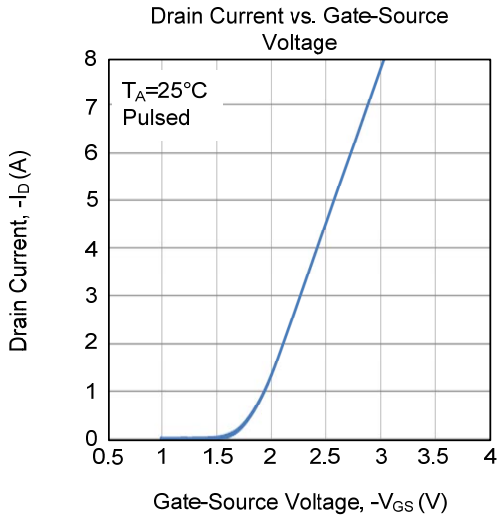
Gate Threshold Voltage vs. Junction Temperature



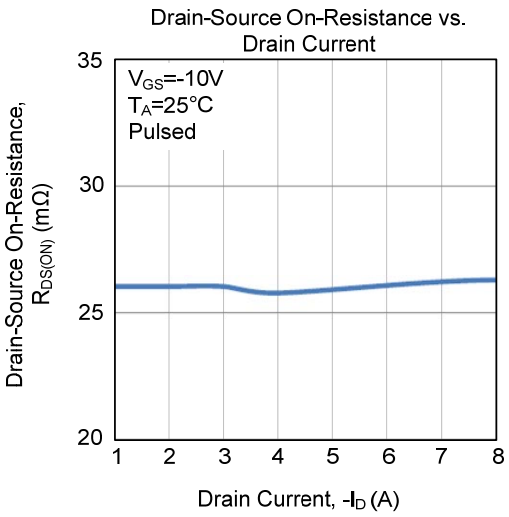
Source Current vs. Source-Drain Voltage



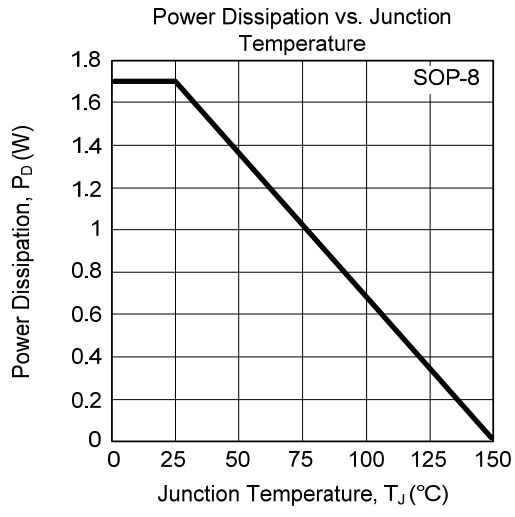
Drain Current vs. Gate-Source Voltage



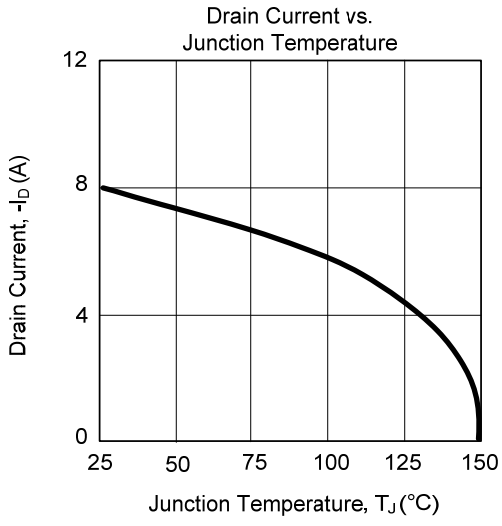
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)