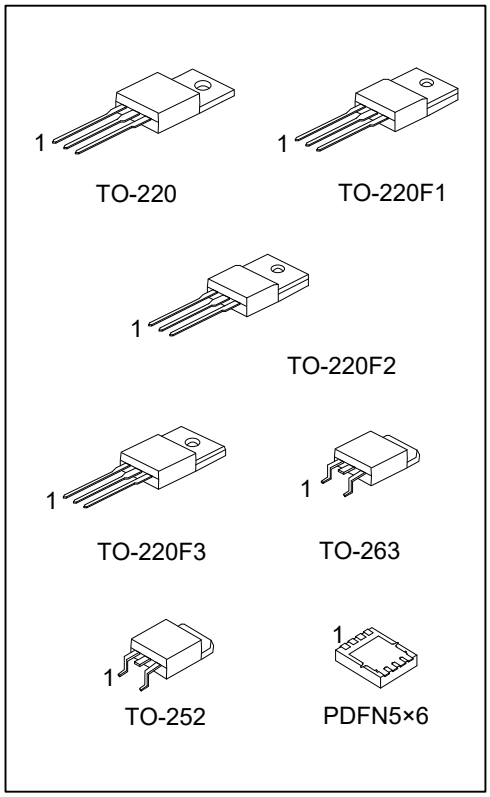
UTT80N08

Power MOSFET

80A, 80V N-CHANNEL POWER MOSFET



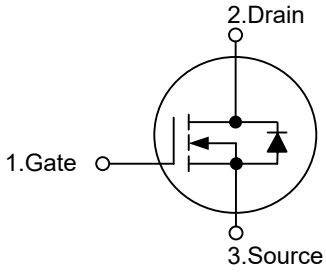
■ DESCRIPTION

The UTC **UTT80N08** is a N-channel MOSFET using UTC advanced technology. It can be used in applications, such as power supply (secondary synchronous rectification), industrial and primary switch etc.

■ FEATURES

* $R_{DS(ON)} \leq 14\ m\Omega$ @ V_{GS}=10V, I_D=80A
* Trench FET Power MOSFETS Technology

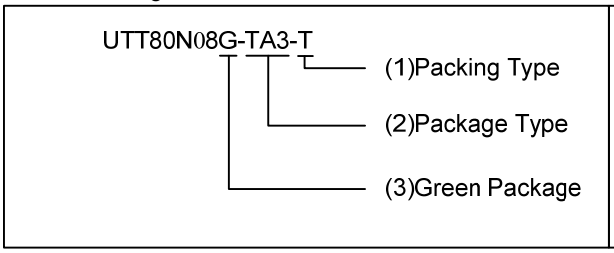
■ SYMBOL



■ ORDERING INFORMATION

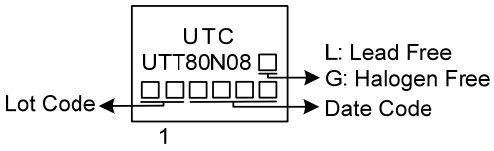
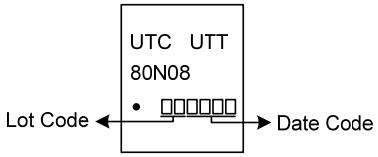
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT80N08L-TA3-T	UTT80N08G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTT80N08L-TF1-T	UTT80N08G-TF1-T	TO-220F1	G	D	S	-	-	-	-	-	Tape Reel
UTT80N08L-TF2-T	UTT80N08G-TF2-T	TO-220F2	G	D	S	-	-	-	-	-	Tube
12N65KL-TF3T-T	UTT80N08G-TF3T-T	TO-220F3	G	D	S	-	-	-	-	-	Tape Reel
UT100N04L-TN3-R	UTT80N08G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTT80N08L-TQ2-T	UTT80N08G-TQ2-T	TO-263	G	D	S	G	D	D	D	D	Tape Reel
UTT80N08L-TQ2-R	UTT80N08G-TQ2-R	TO-263	G	D	S						Tape Reel
UTT80N08L-P5060-R	UTT80N08G-P5060-R	PDFN5×6	S	S	S	G	D	D	D	D	Tape Reel

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



(1) T: Tube, R: Tape Reel
(2) TA3: TO-220, TF1: TO-220F1, TF2: TO-220F2
TF3T: TO-220F3, TQ2: TO-263, TN3: TO-252,
TQ2: TO-263, P5060: PDFN5×6
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

TO-220 / TO-220F1 / TO-220F2 TO-220F3 / TO-252 / TO-263	PDFN5×6
	

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	80	V
Gate Source Voltage		V_{GS}	±20	V
Continuous Drain Current		I_D	80	A
Pulsed Drain Current		I_{DM}	160	A
Avalanche Energy, Single Pulse		E_{AS}	142	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.3	V/ns
Power Dissipation	TO-220/TO-263	P_D	142	W
	TO-220F1/TO-220F2 TO-220F3		39	W
	TO-252		64	W
	PDFN5×6		56	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}=54A, V_{DD}=25V, R_G=20Ω, Starting T_J =25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F1 TO-220F2/TO-220F3 TO-263	θ_{JA}	62.5	°C/W
	TO-252		110	°C/W
	PDFN5×6		65	°C/W
Junction to Case	TO-220/TO-263	θ_{JC}	0.88	°C/W
	TO-220F1/TO-220F2 TO-220F3		3.2	°C/W
	TO-252		1.95	°C/W
	PDFN5×6		2.23	°C/W

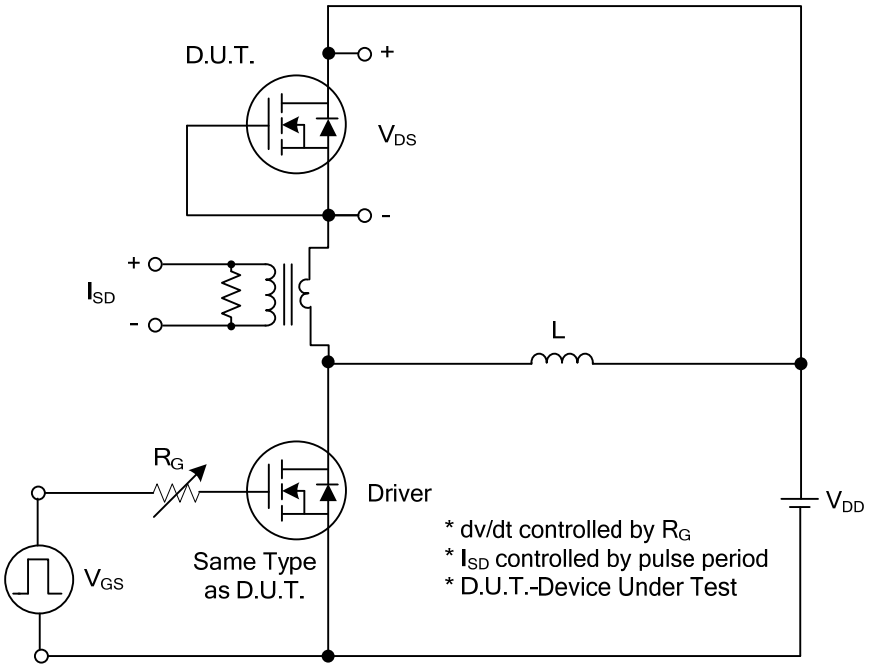
Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

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

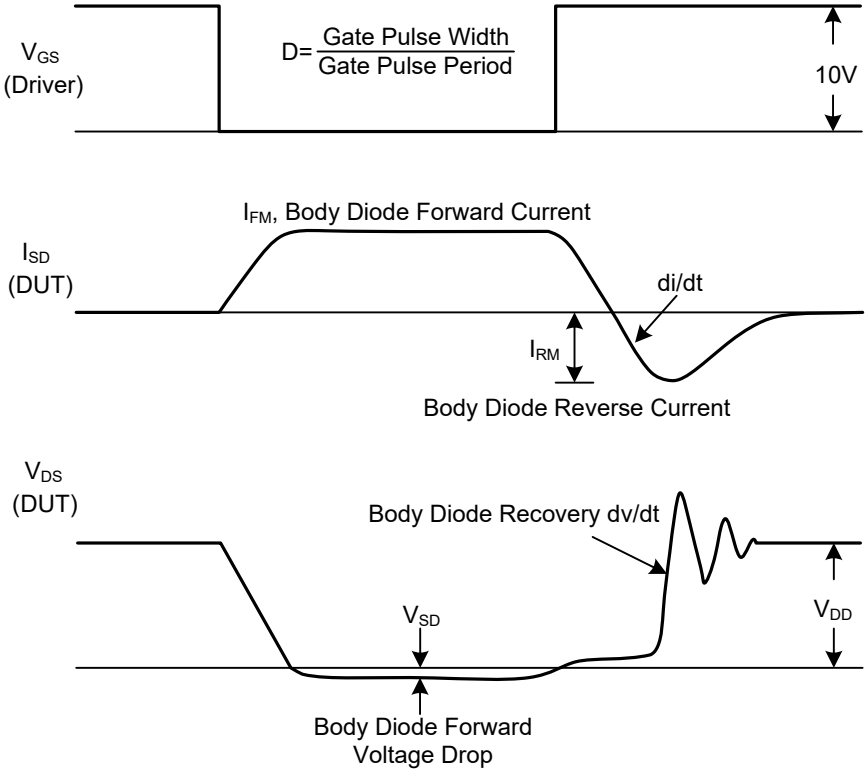
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	80			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=80V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=80A			14	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		4000		pF
Output Capacitance	C_{OSS}			330		pF
Reverse Transfer Capacitance	C_{RSS}			270		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DD}=64V, V_{GS}=0~10V, I_D=80A		110		nC
Gate to Source Charge	Q_{GS}			22		nC
Gate to Drain Charge	Q_{GD}			33		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD}=40V, V_{GS}=10V, I_D=80A, R_G=3.3Ω		18		ns
Rise Time	t_R			20		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			58		ns
Fall-Time	t_F			24		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I_S				80	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				160	A
Drain-Source Diode Forward Voltage	V_{SD}	I_S=80A, V_{GS}=0V		0.9	1.3	V
Reverse Recovery Time (Note 1)	t_{rr}	I_S=30A, V_{GS}=0V, dI_F/dt=100A/μs (Note1)		60		ns
Reverse Recovery Charge	Q_{rr}			220		nC

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

■ TEST CIRCUITS AND WAVEFORMS

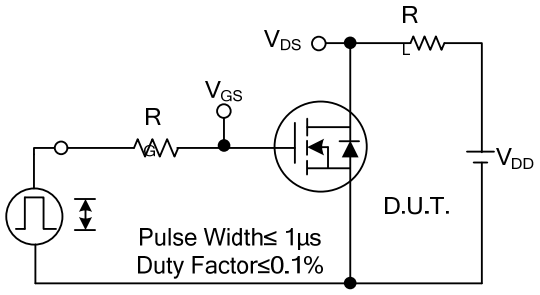


Peak Diode Recovery dv/dt Test Circuit

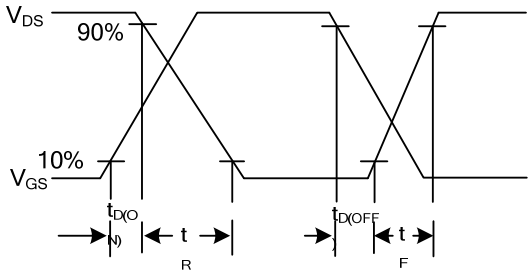


Peak Diode Recovery dv/dt Waveforms

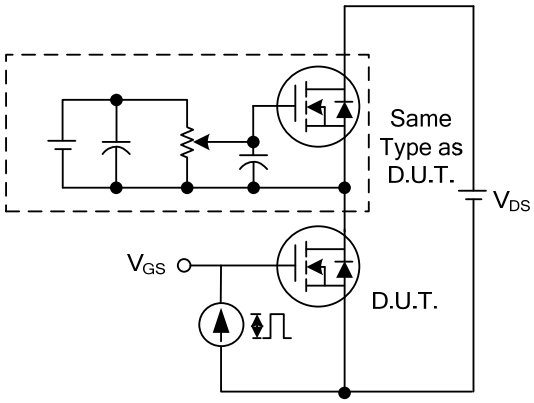
■ TEST CIRCUITS AND WAVEFORMS



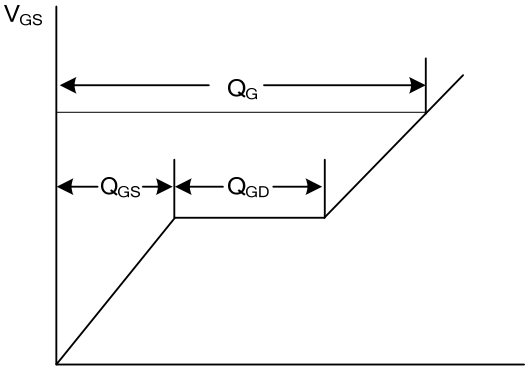
Switching Test Circuit



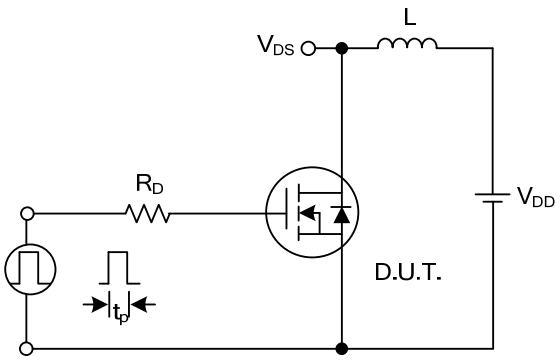
Switching Waveforms



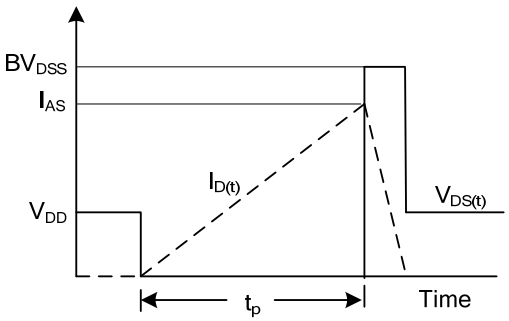
Gate Charge Test Circuit



Gate Charge Waveform



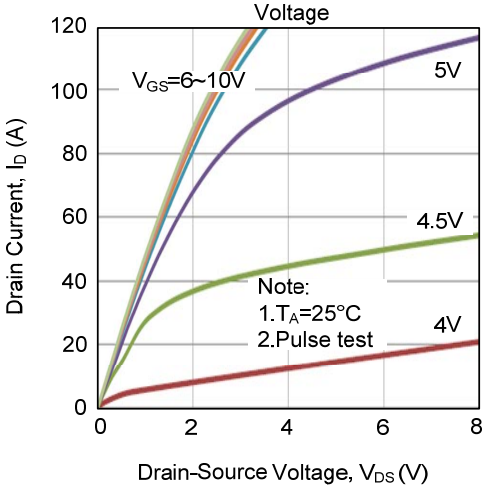
Unclamped Inductive Switching Test Circuit



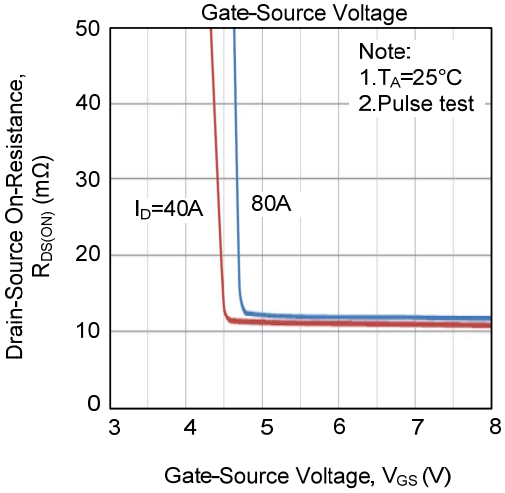
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

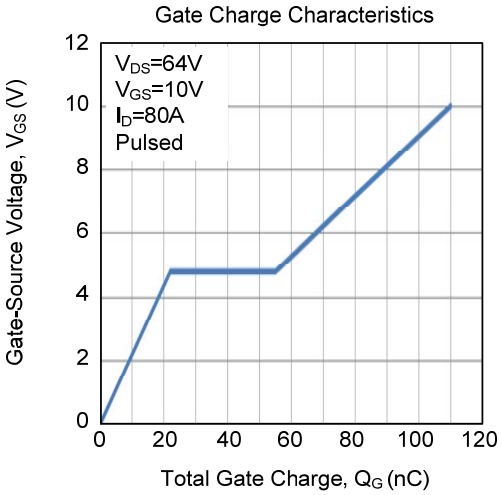
Drain Current vs. Drain-Source Voltage



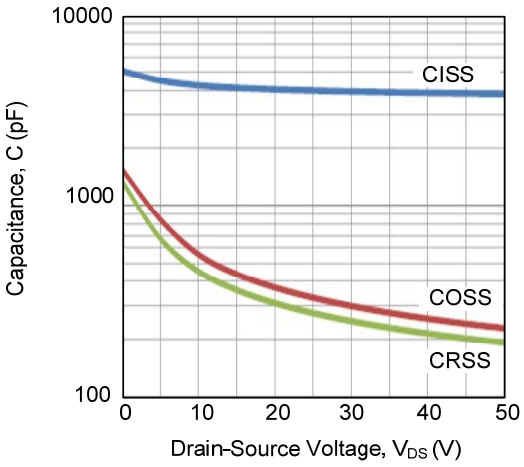
Drain-Source On-Resistance vs. Gate-Source Voltage



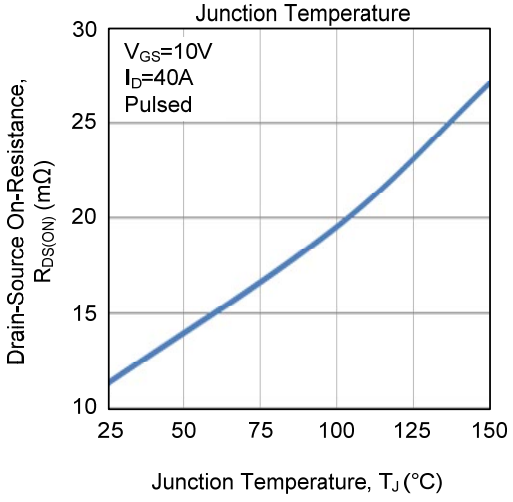
Gate Charge Characteristics



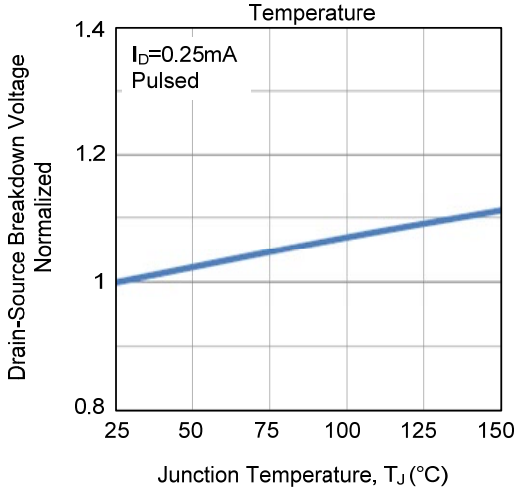
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

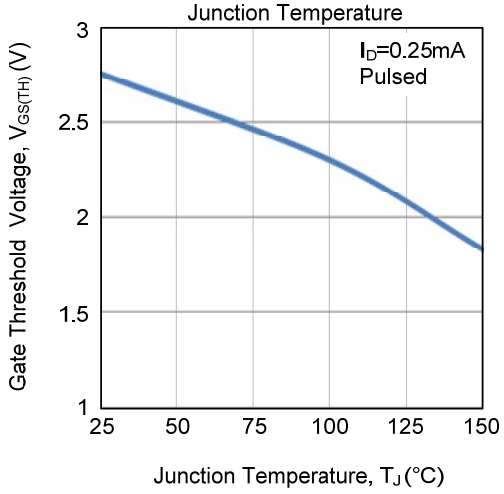


Breakdown Voltage vs. Junction Temperature

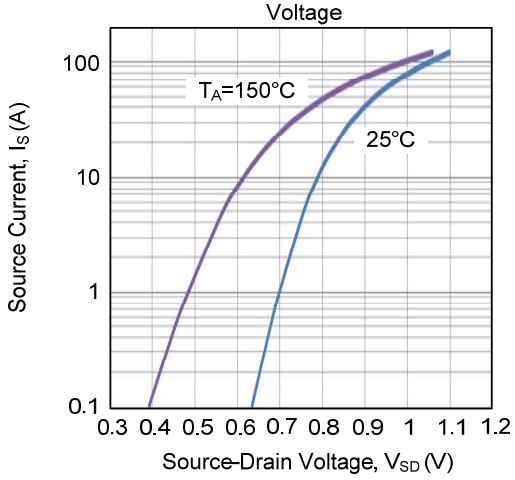


■ TYPICAL CHARACTERISTICS (Cont.)

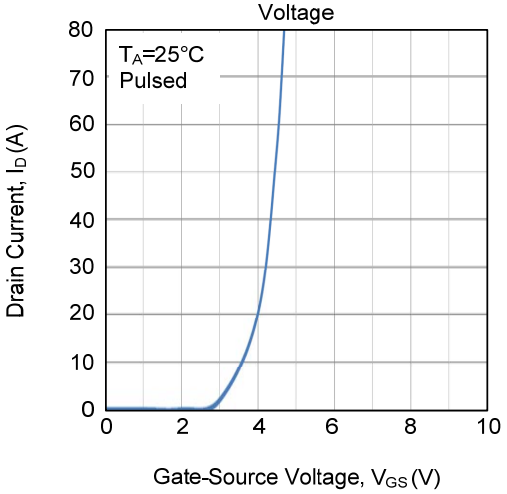
Gate Threshold Voltage vs. Junction Temperature



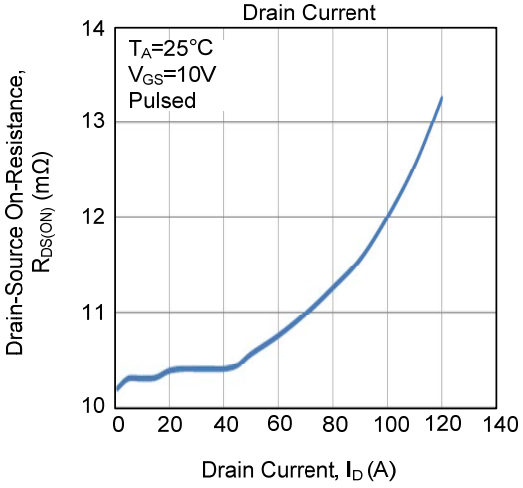
Source Current vs. Source-Drain Voltage



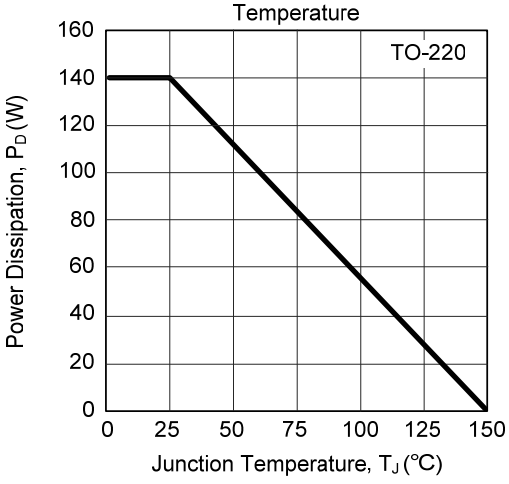
Drain Current vs. Gate-Source Voltage



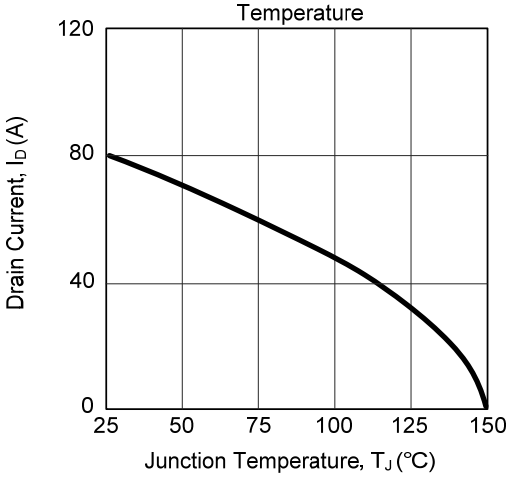
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)