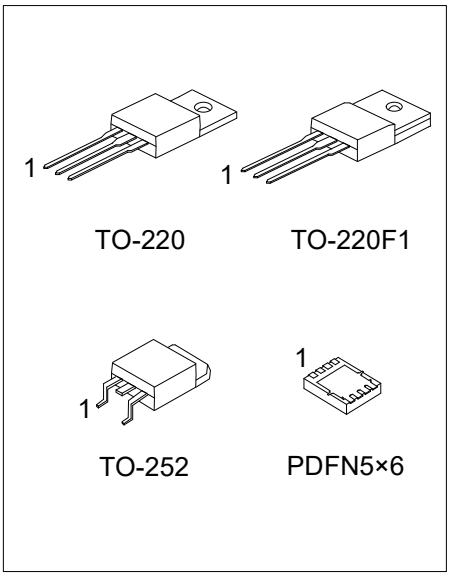
UTT18N20H

POWER MOSFET

18A, 200V N-CHANNEL ENHANCEMENT MODE TRENCH POWER MOSFET



■ DESCRIPTION

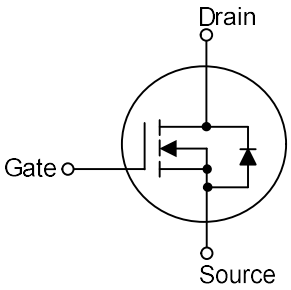
The UTC **UTT18N20H** is a N-channel enhancement mode power MOSFET using UTC's advanced technology to provide customers with ideal for low voltage inverter applications.

The UTC **UTT18N20H** is suitable for high efficiency synchronous rectification in SMPS, UPS, hard switched and high frequency circuits.

■ FEATURES

* $R_{DS(ON)} \leq 90\ m\Omega$ @ $V_{GS} = 10V$, $I_D = 10A$
* High Cell Density Trench Technology
* High Power and Current Handling Capability

■ SYMBOL



■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT18N20HL-TA3-T	UTT18N20HG-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTT18N20HL-TF1-T	UTT18N20HG-TF1-T	TO-220F1	G	D	S	-	-	-	-	-	Tube
UTT18N20HL-TN3-R	UTT18N20HG-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTT18N20HL-P5060-R	UTT18N20HG-P5060-R	PDFN5×6	S	S	S	G	D	D	D	D	Tape Reel

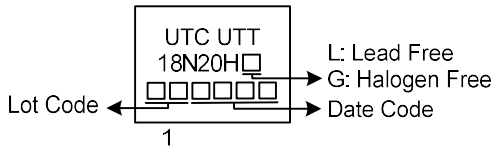
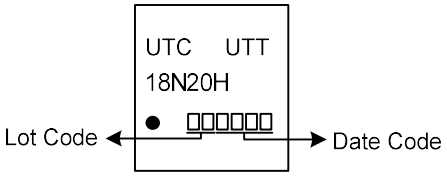
Note: Pin Assignment: G: Gate D: Drain S: Source

UTT18N20HG-TA3-T
(1)Packing Type
(2)Package Type
(3)Green Package

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

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■ MARKING

TO-220 / TO-220F1 / TO-252	PDFN5×6
	

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	200	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current	Continuous	I_D	18	A
Pulsed Drain Current	Pulsed (Note 2)	I_{DM}	54	A
Peak Diode Recovery dv/dt (Note 3)		dv/dt	6.7	V/nS
Power Dissipation	TO-220	P_D	100	W
	TO-220F1		40	W
	TO-252		54	W
	PDFN5×6		14	W
Junction Temperature		T_J	+150	°C
Storage Temperature Range		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. I_{SD} ≤ 18A, di/dt ≤ 200A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J = 25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220 TO-220F1	θ_{JA}	62.5	°C/W
	TO-252		110	°C/W
	PDFN5×6		65 (Note)	°C/W
Junction to Case	TO-220	θ_{JC}	1.25	°C/W
	TO-220F1		3.125	°C/W
	TO-252		2.31 (Note)	°C/W
	PDFN5×6		8.93 (Note)	°C/W

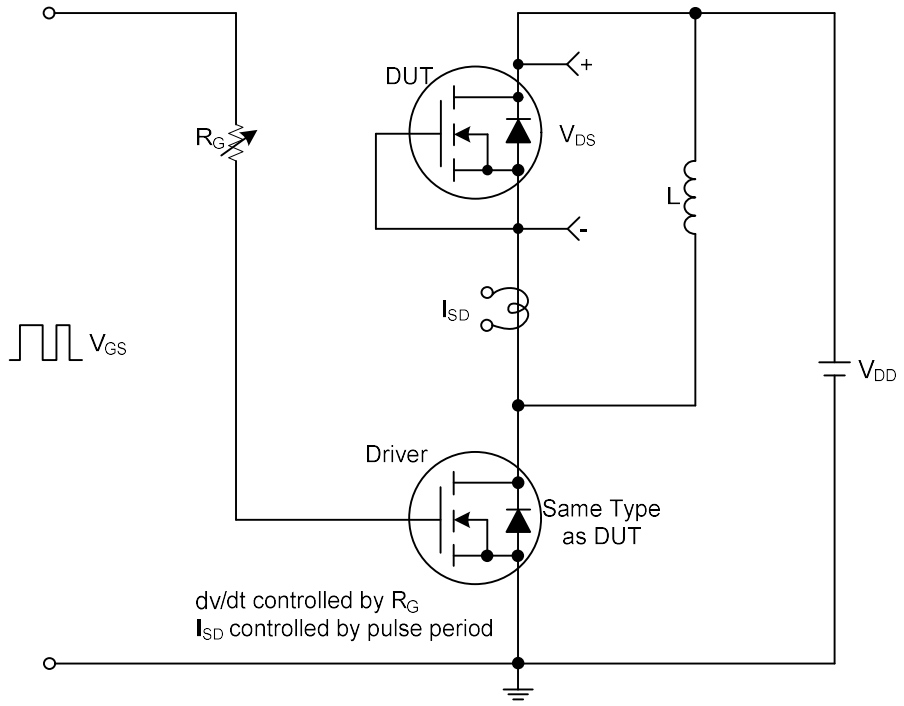
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

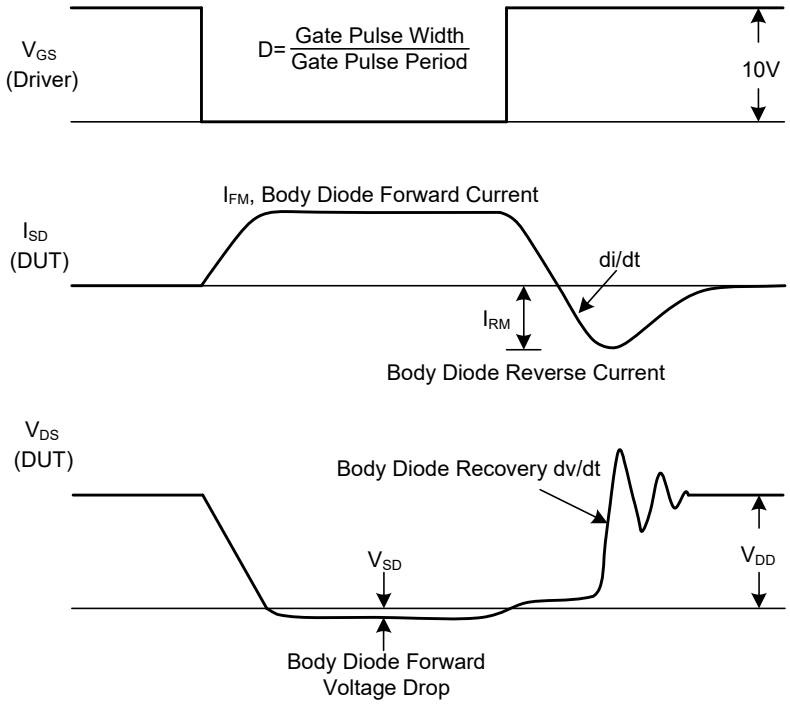
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250uA, V_{GS}=0V	200			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=200V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-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=10A			90	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		3682		pF
Output Capacitance		C_{OSS}			151		pF
Reverse Transfer Capacitance		C_{RSS}			96		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q_G	V_{DS}=160V, V_{GS}=10V, I_D=18A (Note 1, 2)		79		nC
Gate to Source Charge		Q_{GS}			18		nC
Gate to Drain Charge		Q_{GD}			25		nC
Turn-on Delay Time (Note 1)		$t_{D(ON)}$	V_{DS}=100V, V_{GS}=10V, I_D=18A, R_G=25Ω (Note 1, 2)		55		ns
Rise Time		t_R			42		ns
Turn-off Delay Time		$t_{D(OFF)}$			191		ns
Fall-Time		t_F			76		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				18	A
Maximum Body-Diode Pulsed Current		I_{SM}				54	A
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	I_S=20A, V_{GS}=0V			1.2	V
Reverse recovery time (Note 1)		t_{rr}	I_S=18A, V_{GS}=0V, dI_F/dt = 100A/μs		111		ns
Reverse recovery charge		Q_{rr}			419		nC

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

■ TEST CIRCUITS AND WAVEFORMS



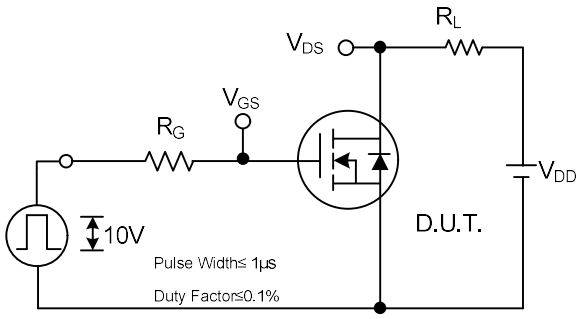
Peak Diode Recovery dv/dt Test Circuit



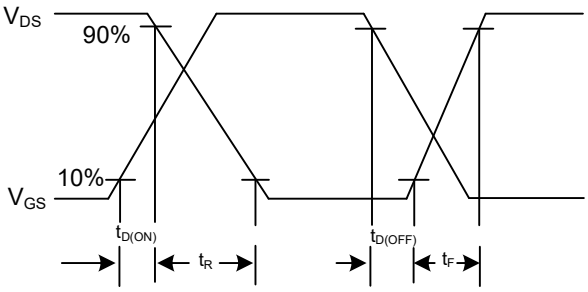
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

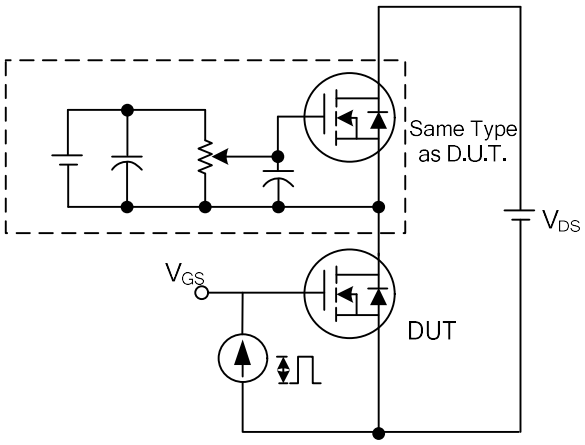
■ TEST CIRCUITS AND WAVEFORMS



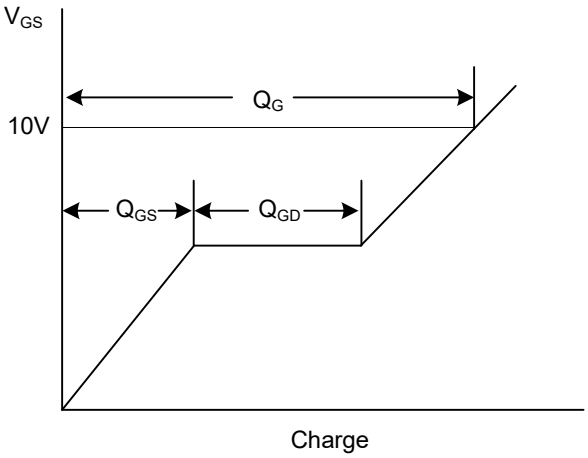
Switching Test Circuit



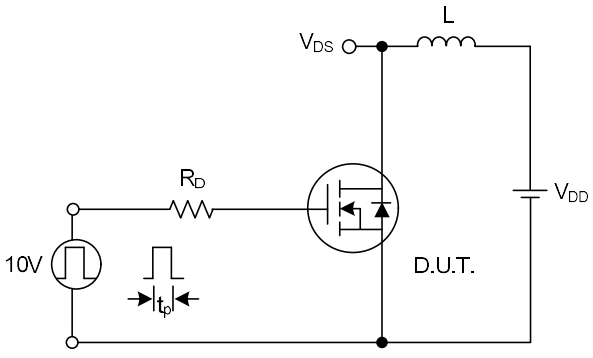
Switching Waveforms



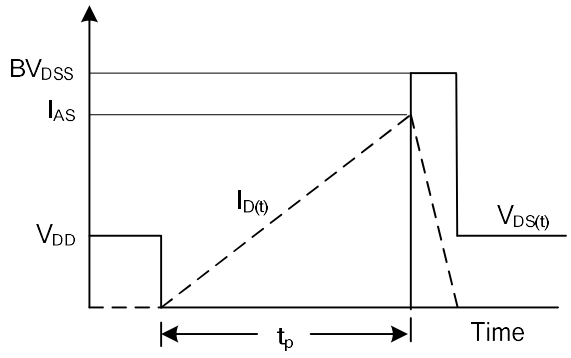
Gate Charge Test Circuit



Gate Charge Waveform

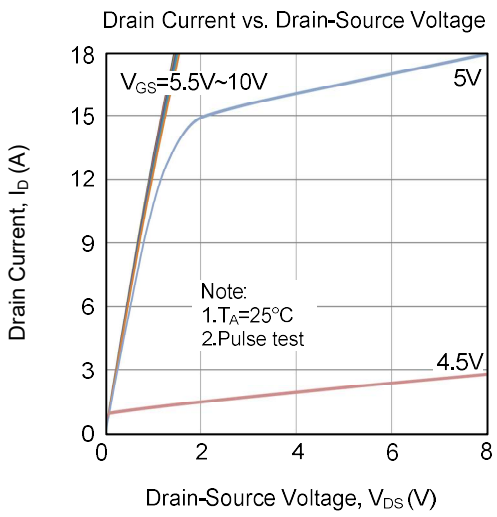


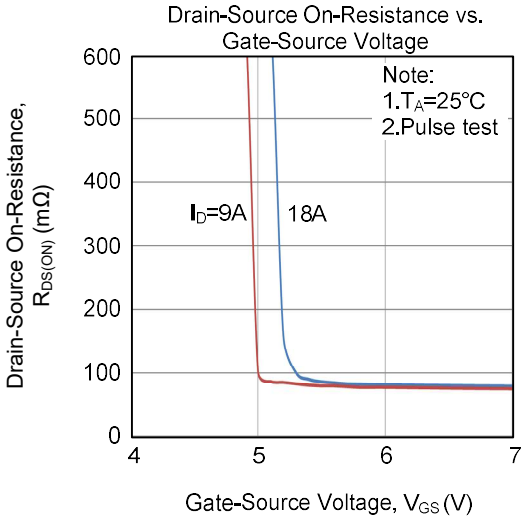
Unclamped Inductive Switching Test Circuit

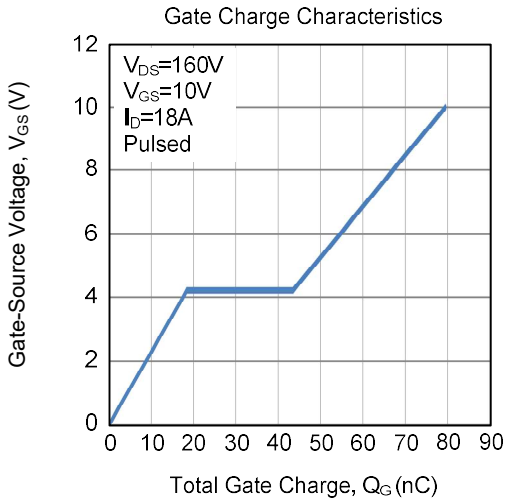


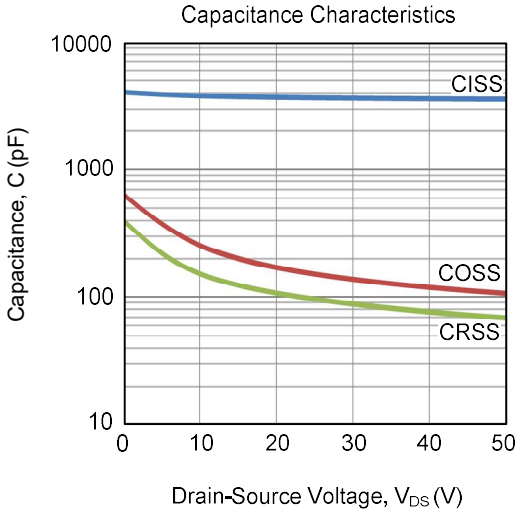
Unclamped Inductive Switching Waveforms

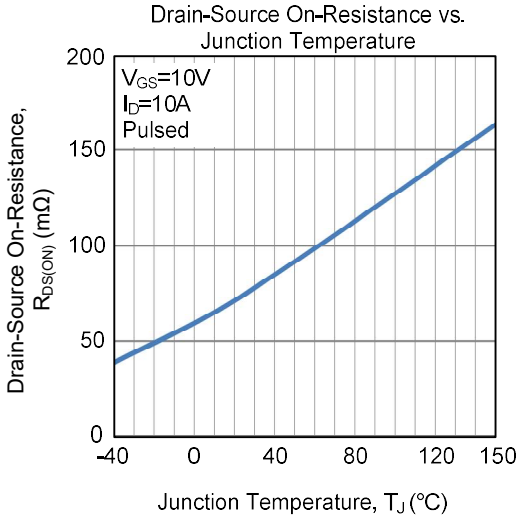
■ TYPICAL CHARACTERISTICS

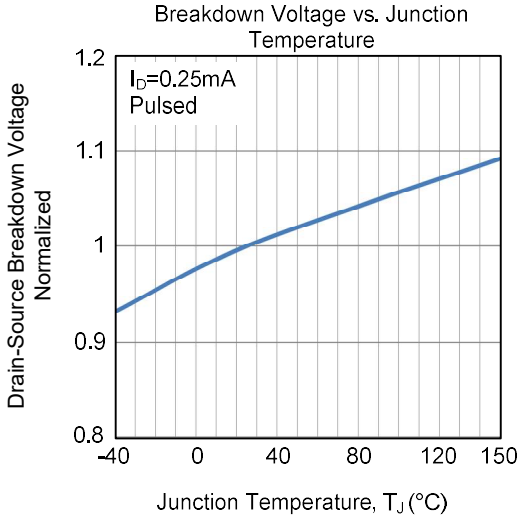






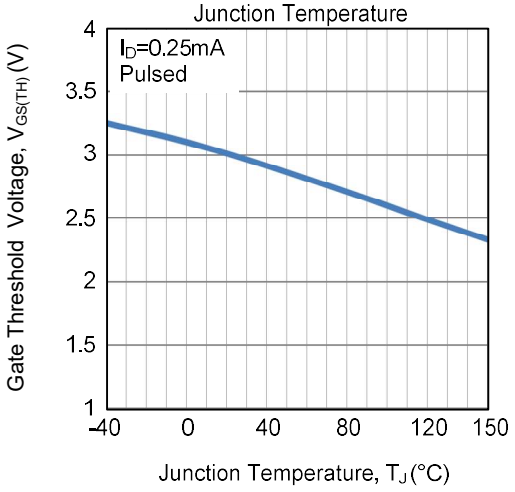




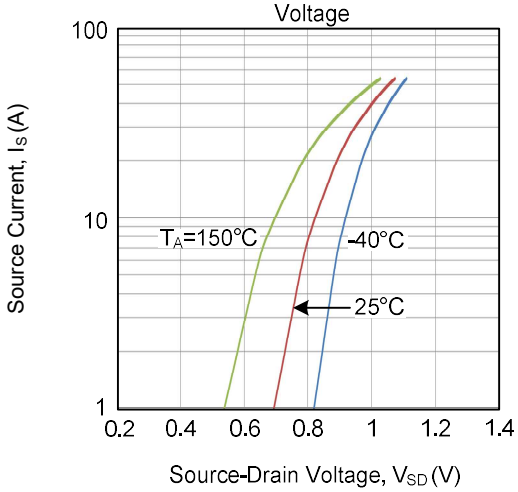


■ TYPICAL CHARACTERISTICS (Cont.)

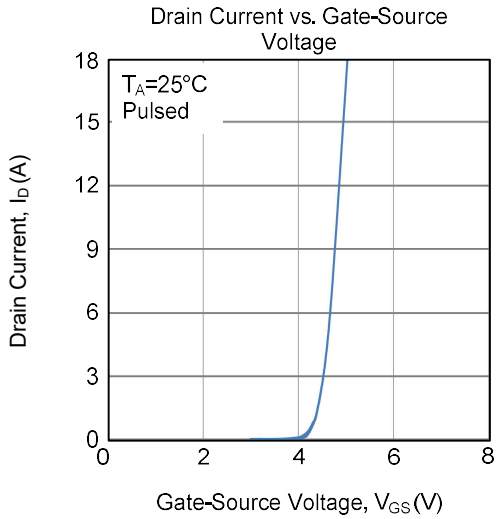
Gate Threshold Voltage vs. Junction Temperature



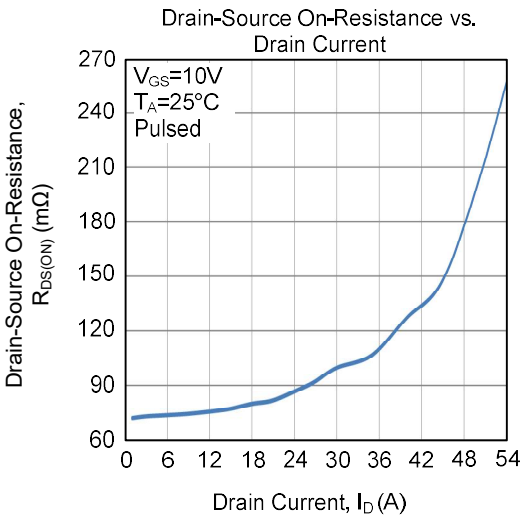
Source Current vs. Source-Drain Voltage



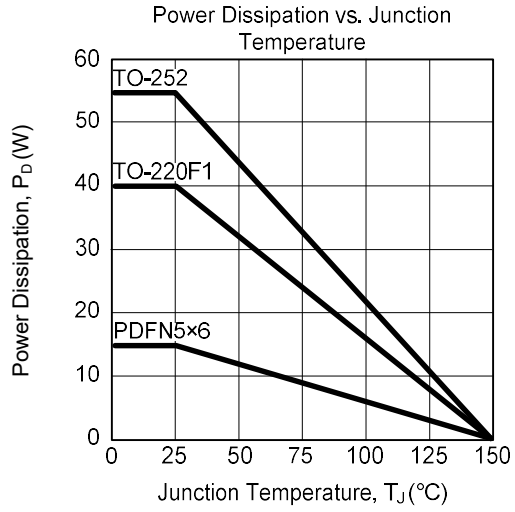
Drain Current vs. Gate-Source Voltage



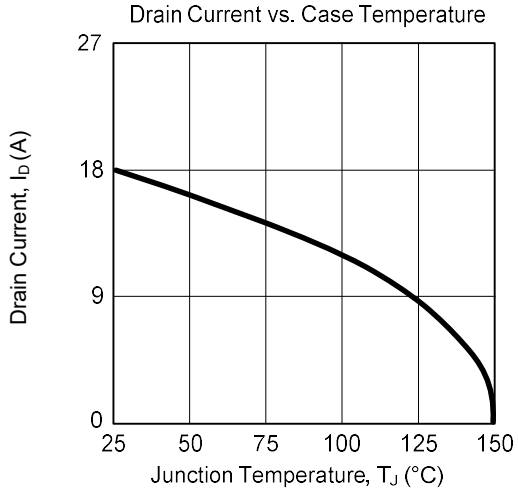
Drain-Source On-Resistance vs. Drain Current



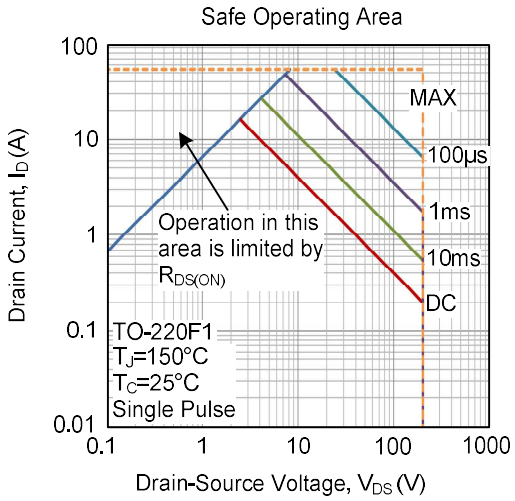
Power Dissipation vs. Junction Temperature



Drain Current vs. Case Temperature



■ TYPICAL CHARACTERISTICS (Cont.)



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