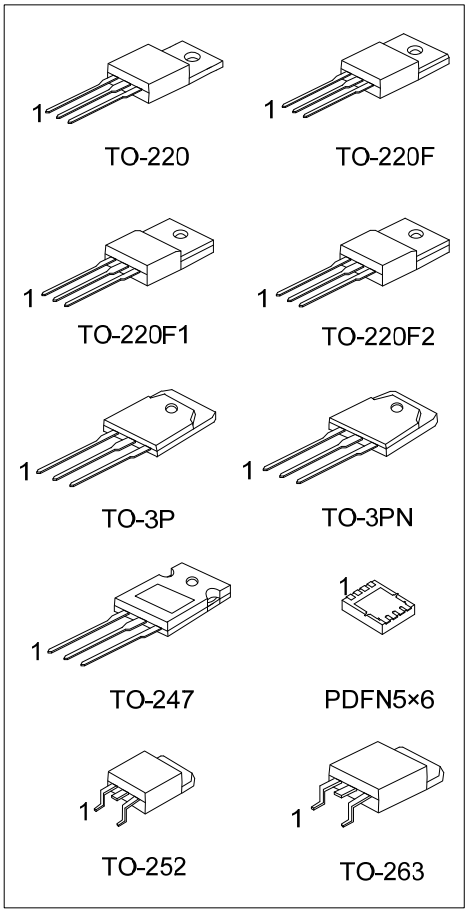
UTT80N10H

Power MOSFET

80A, 100V N-CHANNEL POWER MOSFET



■ DESCRIPTION

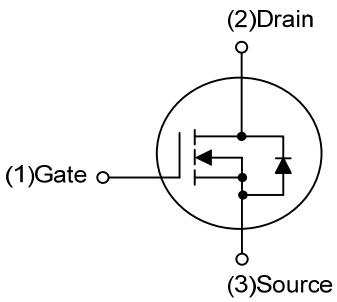
The UTC **UTT80N10H** is a N-channel Power MOSFET, it uses UTC's advanced technology to provide the customers with high switching speed and low gate charge, etc.

The UTC **UTT80N10H** applies to primary side switch, synchronous rectifier, Motor Drives, etc.

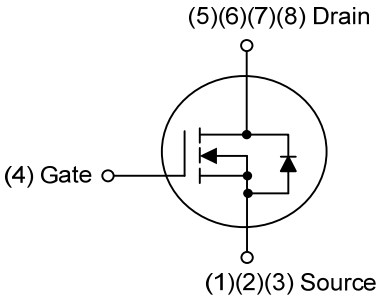
■ FEATURES

* $R_{DS(ON)} \leq 14\ m\Omega$ @ V_{GS}=10V, I_D=40A
* High Cell Density Trench Technology
* High Power and Current Handling Capability

■ SYMBOL



TO-220/TO-220F/TO-220F1/TO-220F2
TO-3P/TO-3PN/TO-247/TO-252/TO-263

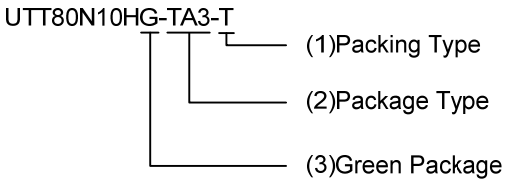


PDFN5×6

■ ORDERING INFORMATION

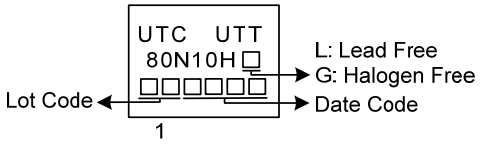
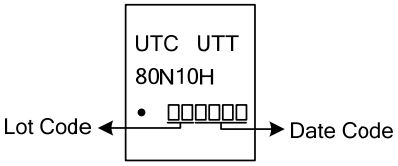
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT80N10HL-TA3-T	UTT80N10HG-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTT80N10HL-TF1-T	UTT80N10HG-TF1-T	TO-220F1	G	D	S	-	-	-	-	-	Tube
UTT80N10HL-TF2-T	UTT80N10HG-TF2-T	TO-220F2	G	D	S	-	-	-	-	-	Tube
UTT80N10HL-TF3-T	UTT80N10HG-TF3-T	TO-220F	G	D	S	-	-	-	-	-	Tube
UTT80N10HL-T47-T	UTT80N10HG-T47-T	TO-247	G	D	S						Tube
UTT80N10HL-TN3-R	UTT80N10HG-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTT80N10HL-TQ2-T	UTT80N10HG-TQ2-T	TO-263	G	D	S	-	-	-	-	-	Tube
UTT80N10HL-TQ2-R	UTT80N10HG-TQ2-R	TO-263	G	D	S	-	-	-	-	-	Tape Reel
UTT80N10HL-T3P-T	UTT80N10HG-T3P-T	TO-3P	G	D	S						Tube
UTT80N10HL-T3N-T	UTT80N10HG-T3N-T	TO-3PN	G	D	S						Tube
UTT80N10HL-P5060-R	UTT80N10HG-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, TF3: TO-220F, T47: TO-247, TN3: TO-252, TQ2: TO-263, T3P: TO-3P, T3N: TO-3PN, P5060: PDFN5×6
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

TO-220 / TO-220F / TO-220F1 / TO-220F2 TO-3P / TO-3PN / TO-247 / TO-252 / TO-263	PDFN5×6
	

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	Continuous	I_D	80	A
	Pulsed (Note 2)	I_{DM}	160	A
Avalanche Current (Note 2)		I_{AR}	20	A
Single Pulsed Avalanche Energy (Note 3)		E_{AS}	22	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	3.6	V/ns
Power Dissipation	TO-220/TO-263	P_D	142	W
	TO-220F TO-220F1		39	W
	TO-220F2		41	W
	TO-3P/TO-3PN		320	W
	TO-247		312	W
	TO-252		55	W
	PDFN5×6		39	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. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
3. L = 0.1mH, I_{AS} = 20A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
4. I_{SD} ≤ 30A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, T_J ≤T_{JMAX}, T_J = 25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F TO-220F1 TO-220F2 TO-263	θ_{JA}	62.5	°C/W
	TO-3P/TO-3PN		40	°C/W
	TO-247		50	°C/W
	TO-252		110	°C/W
	PDFN5×6		65 (Note)	°C/W
Junction to Case	TO-220/TO-263	θ_{JC}	0.88	°C/W
	TO-220F TO-220F1		3.2	°C/W
	TO-220F2		3.05	°C/W
	TO-3P/TO-3PN		0.39	°C/W
	TO-247		0.4	°C/W
	TO-252		2.27 (Note)	°C/W
	PDFN5×6		3.2 (Note)	°C/W

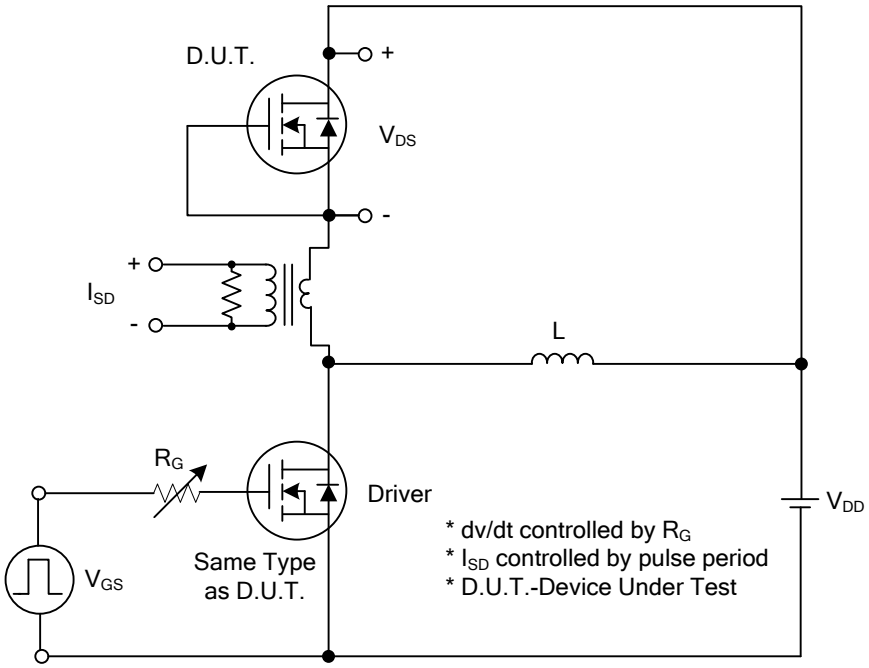
Note: The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

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

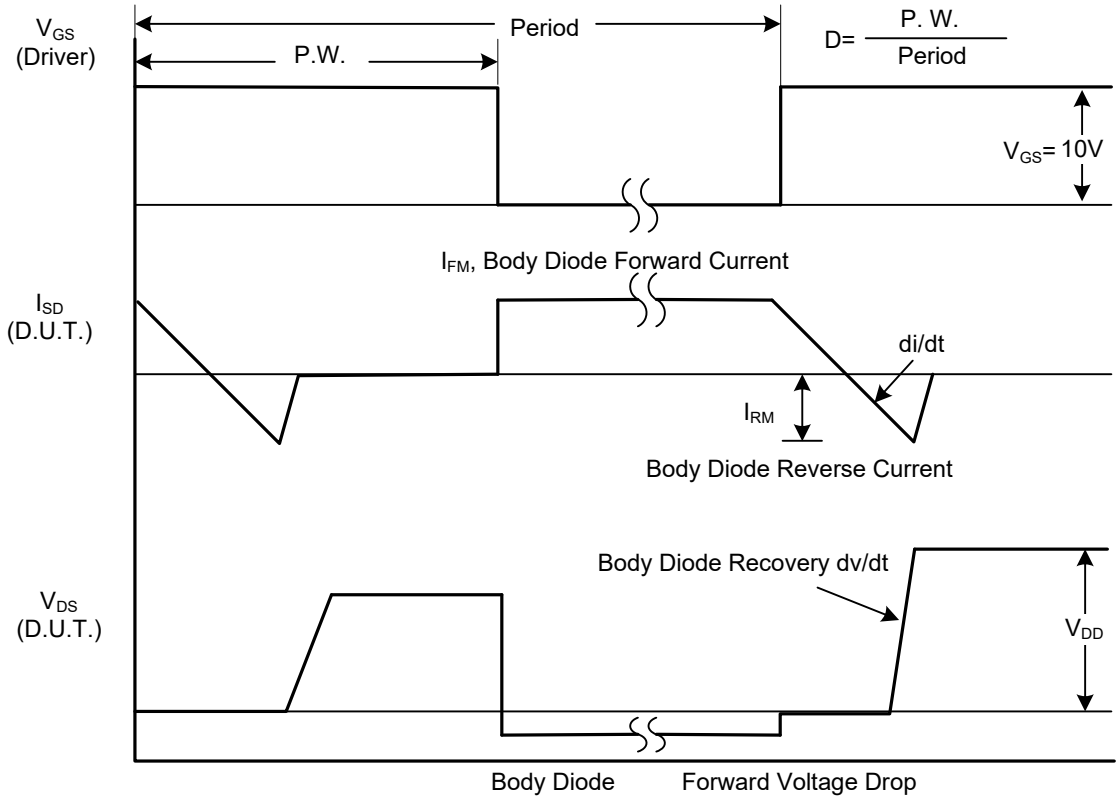
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	100			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=80V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		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=40A		12	14	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{DS}=25V, V_{GS}=0V, f=1.0MHz		2750		pF
Output Capacitance		C_{OSS}			285		pF
Reverse Transfer Capacitance		C_{RSS}			230		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q_G	V_{DS}=80V, V_{GS}=10V, I_D=80A		80		nC
Gate to Source Charge		Q_{GS}			20		nC
Gate to Drain Charge		Q_{GD}			32		nC
Turn-ON Delay Time		$t_{D(ON)}$	V_{DD}=50V, V_{GS}=10V, I_D=80A, R_G =6Ω		16		ns
Rise Time		t_R			21		ns
Turn-OFF Delay Time		$t_{D(OFF)}$			56		ns
Fall-Time		t_F			34		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				80	A
Maximum Body-Diode Pulsed Current		I_{SM}				160	A
Drain-Source Diode Forward Voltage		V_{SD}	I_{SD}=80A			1.25	V
Body Diode Reverse Recovery Time		t_{rr}	I_S=30A, dI/dt=100A/μs		134		ns
Body Diode Reverse Recovery Charge		Q_{rr}			247		nC

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

■ TEST CIRCUITS AND WAVEFORMS

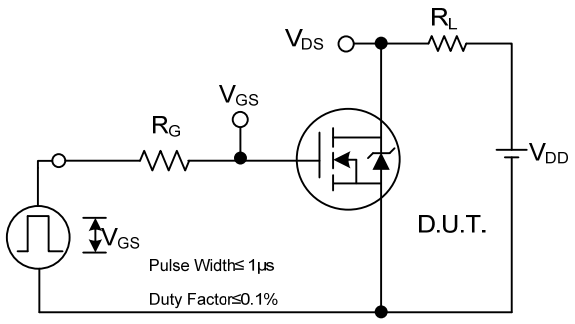


Peak Diode Recovery dv/dt Test Circuit

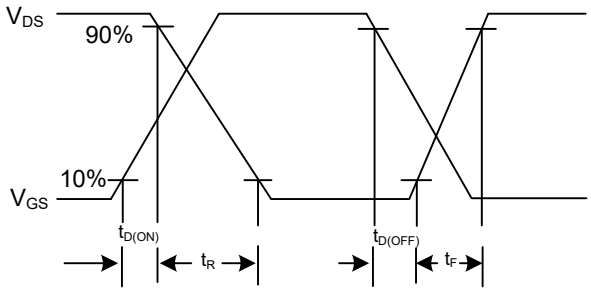


Peak Diode Recovery dv/dt Waveforms

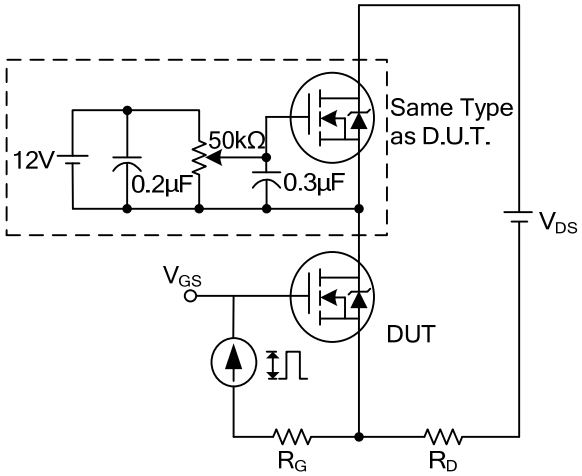
■ TEST CIRCUITS AND WAVEFORMS



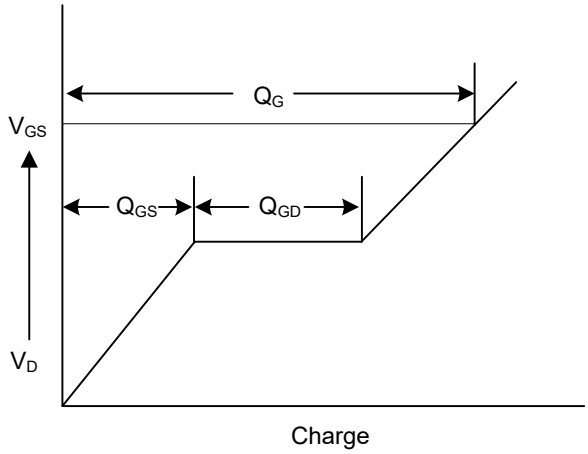
Switching Test Circuit



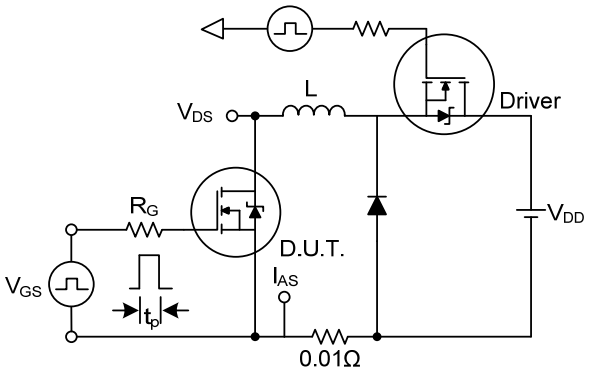
Switching Waveforms



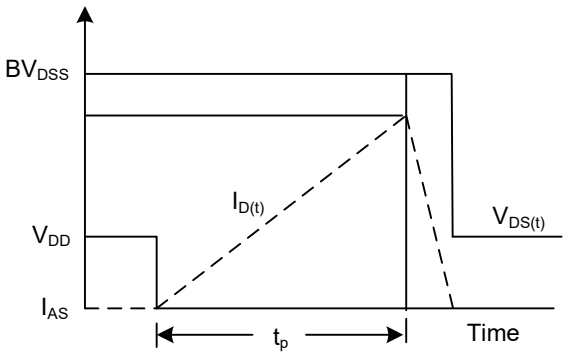
Gate Charge Test Circuit



Gate Charge Waveform



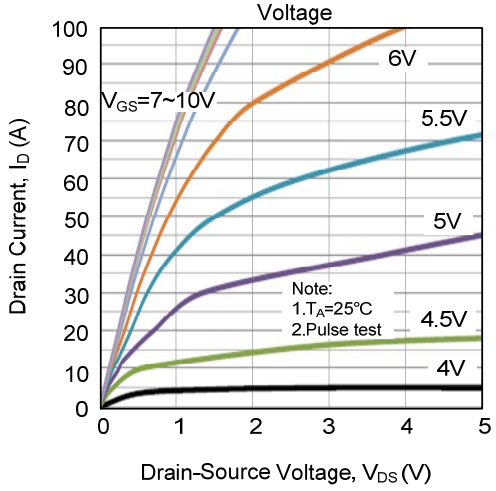
Unclamped Inductive Switching Test Circuit



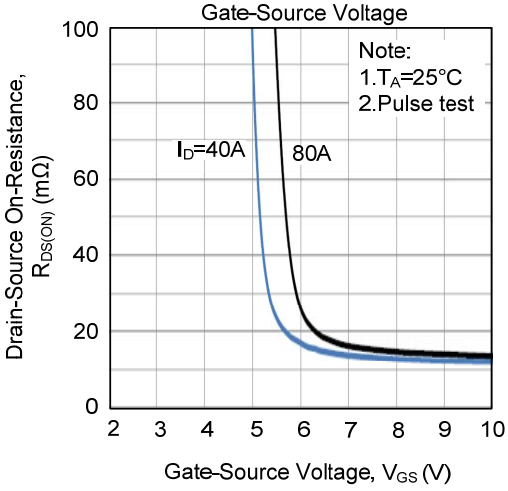
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

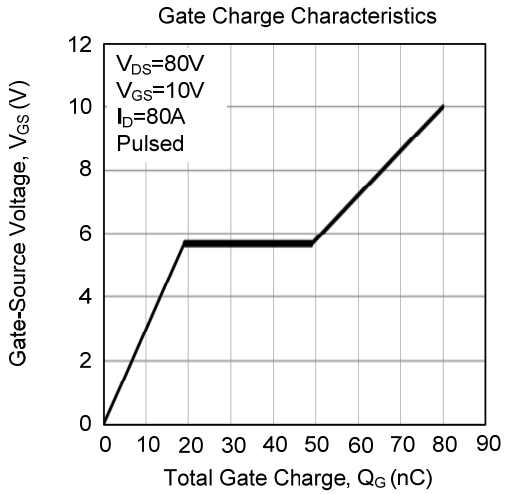
Drain Current vs. Drain-Source Voltage



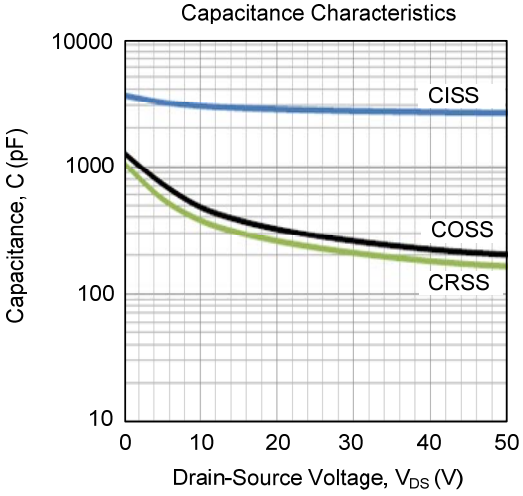
Drain-Source On-Resistance vs. Gate-Source Voltage



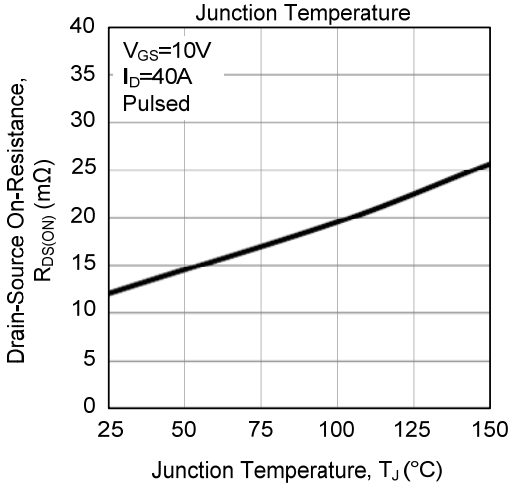
Gate Charge Characteristics



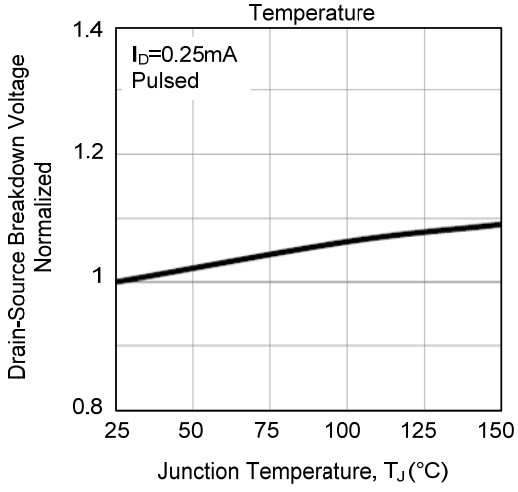
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

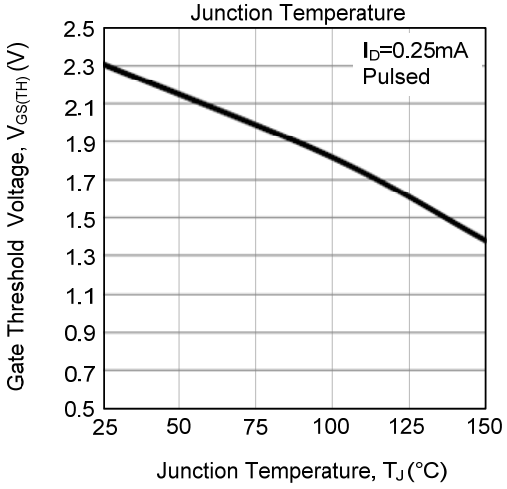


Breakdown Voltage vs. Junction Temperature

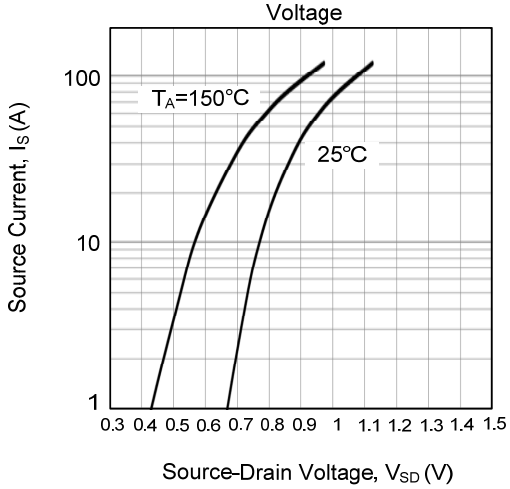


■ TYPICAL CHARACTERISTICS (Cont.)

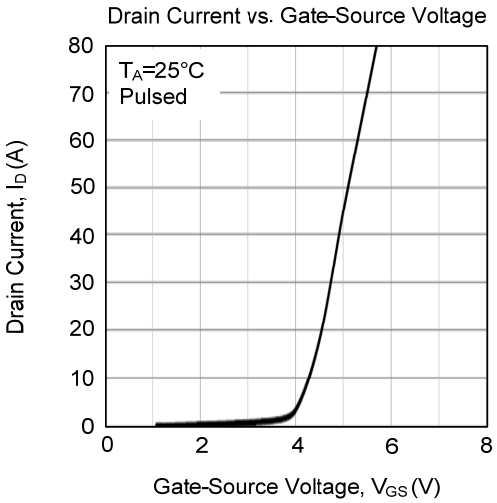
Gate Threshold Voltage vs. Junction Temperature



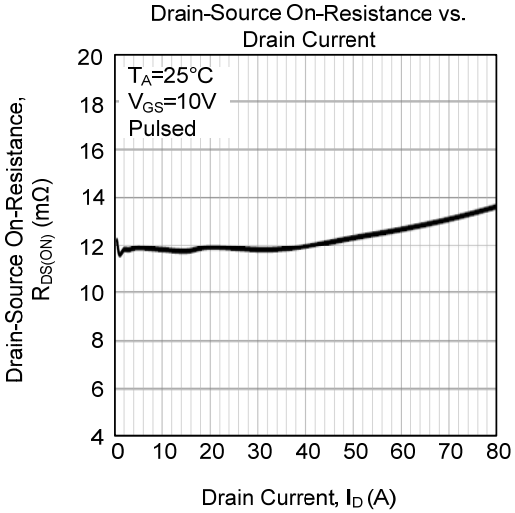
Source Current vs. Source-Drain Voltage



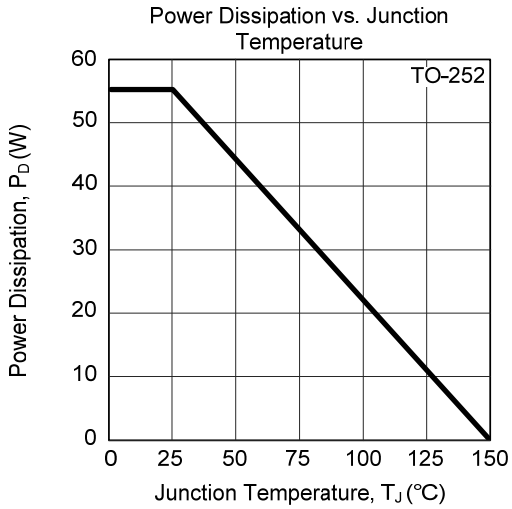
Drain Current vs. Gate-Source Voltage



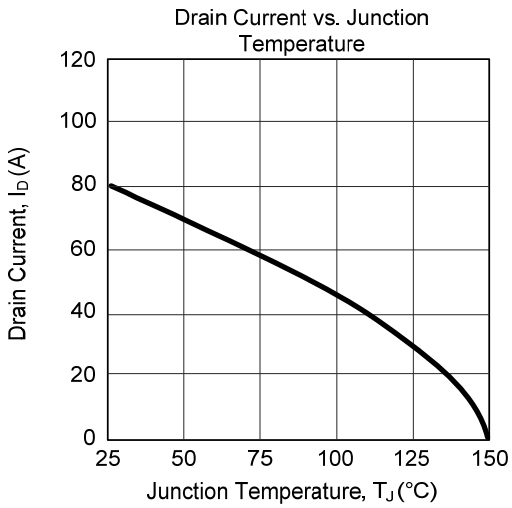
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)