



UTT18P10

Power MOSFET

-100V, -18A P-CHANNEL POWER MOSFET

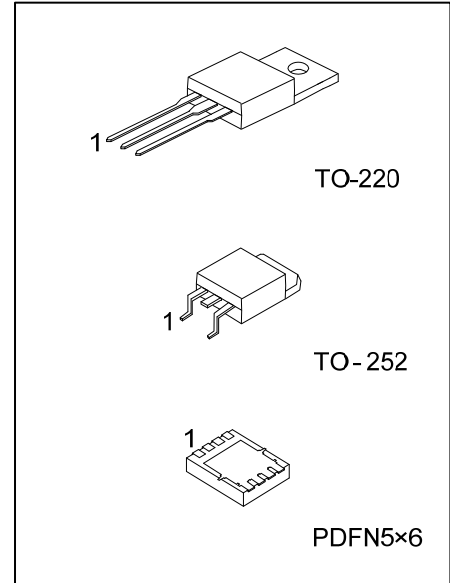
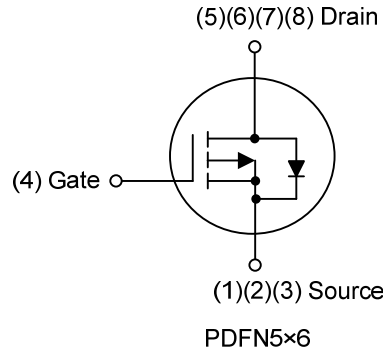
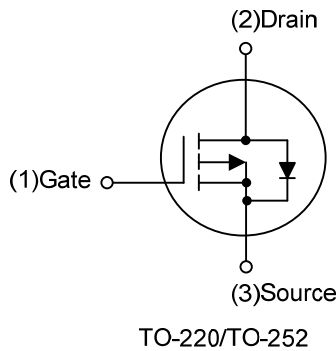
■ DESCRIPTION

The UTC **UTT18P10** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed, cost-effectiveness and a minimum on-state resistance. It can also withstand high energy in the avalanche.

■ FEATURES

- * $R_{DS(ON)} \leq 180\text{ m}\Omega$ @ $V_{GS}=-10\text{V}$, $I_D=-9.0\text{A}$
- $R_{DS(ON)} \leq 210\text{ m}\Omega$ @ $V_{GS}=-4.5\text{V}$, $I_D=-9.0\text{A}$
- * High Switching Speed

■ SYMBOL



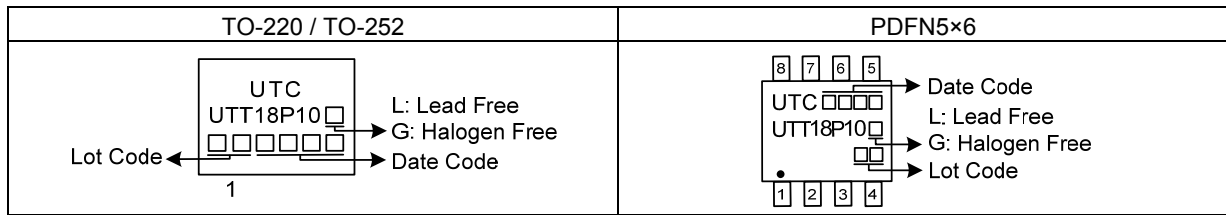
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT18P10L-TA3-T	UTT18P10G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTT18P10L-TN3-R	UTT18P10G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTT18P10L-P5060-R	UTT18P10G-P5060-R	PDFN5x6	S	S	S	G	D	D	D	D	Tape Reel

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

<p>UTT18P10G-TA3-T</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) TA3: TO-220, TN3: TO-252, P5060: PDFN5x6</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	-100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	Continuous, $V_{GSS} @ -10\text{V}$ $T_C=25^\circ\text{C}$	I_D	-18	A
	Pulsed (Note 3)	I_{DM}	-24	A
Avalanche Energy	Single Pulsed (Note 4)	E_{AS}	39.2	mJ
Power Dissipation ($T_C=25^\circ\text{C}$)	TO-220	P_D	100	W
	TO-252		48	W
	PDFN5x6		13	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^\circ\text{C}$

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. $L = 0.1\text{mH}$, $I_{AS} = -19.8\text{A}$, $V_{DD} = -50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	$^\circ\text{C/W}$
	TO-252		110	$^\circ\text{C/W}$
	PDFN5x6		65 (Note)	$^\circ\text{C/W}$
Junction to Case	TO-220	θ_{JC}	1.25	$^\circ\text{C/W}$
	TO-252		2.6 (Note)	$^\circ\text{C/W}$
	PDFN5x6		9.6 (Note)	$^\circ\text{C/W}$

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 =-250μA, V _{GS} =0V	-100			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-100V, V _{GS} =0V			-1	μA
Gate- Source Leakage Current	Forward	V _{GS} =+20V, V _{GS} =0V			+100	nA
	Reverse	V _{GS} =-20V, V _{GS} =0V			-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-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-9.0A			180	mΩ
		V _{GS} =-4.5V, I _D =-9.0A			210	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{DS} =-25V, V _{GS} =0V, f=1.0MHz		1592		pF
Output Capacitance	C _{OSS}			83.5		pF
Reverse Transfer Capacitance	C _{RSS}			69.1		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q _G	V _{DS} =-80V, V _{GS} =-10V, I _D =-18A I _G =-1mA (Note 1, 2)		34.2		nC
Gate to Source Charge	Q _{GS}			7.0		nC
Gate to Drain ("Miller") Charge	Q _{GD}			5.6		nC
Turn-ON Delay Time	t _{D(ON)}	V _{DD} =-50V, V _{GS} =-10V, I _D =-18A, R _G =6Ω (Note 1, 2)		5.8		ns
Rise Time	t _R			17.3		ns
Turn-OFF Delay Time	t _{D(OFF)}			37.6		ns
Fall-Time	t _F			17.2		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I _S				-18	A
Maximum Body-Diode Pulsed Current (Note 2)	I _{SM}				-24	A
Drain-Source Diode Forward Voltage	V _{SD}	I _S =-18A, V _{GS} =0V			-5.0	V
Body Diode Reverse Recovery Time	t _{rr}	I _S =-18A, V _{GS} =0V,		106		ns
Body Diode Reverse Recovery Charge	Q _{rr}	di _F /dt=100A/μs (Note 2)		0.4		μC

Notes: 1. Essentially independent of operating temperature.

2. Pulse width ≤ 300μs; duty cycle ≤ 2%.

TEST CIRCUITS AND WAVEFORMS

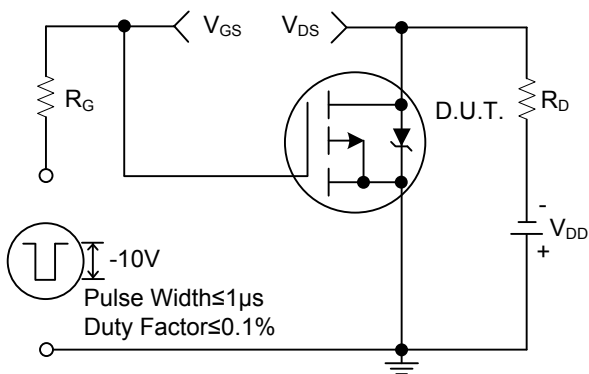


Fig. 1a Switching Time Test Circuit

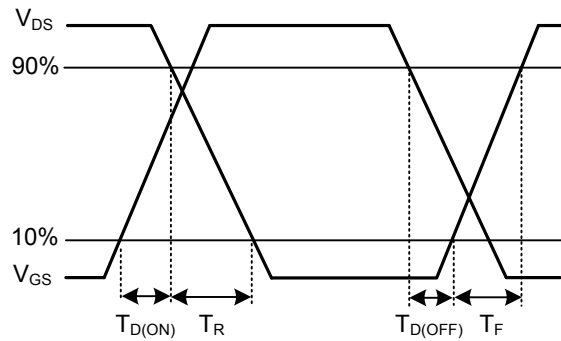


Fig. 1b Switching Time Waveforms

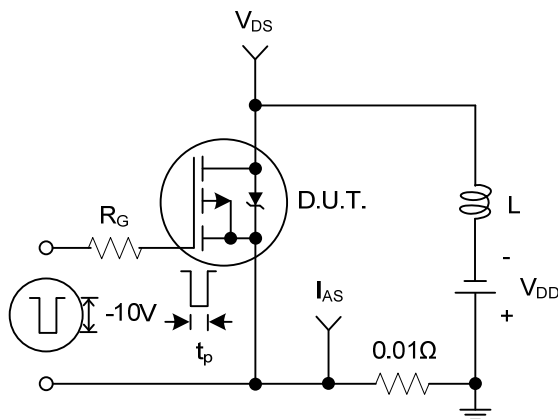


Fig. 2a Unclamped Inductive Test Circuit

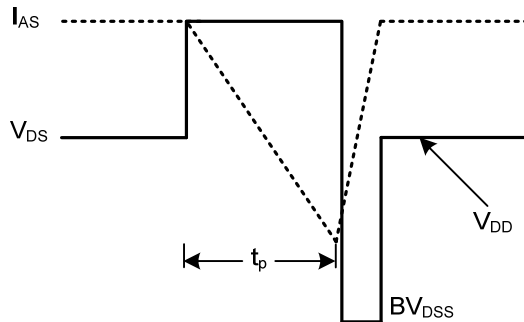


Fig. 2b Unclamped Inductive Waveforms

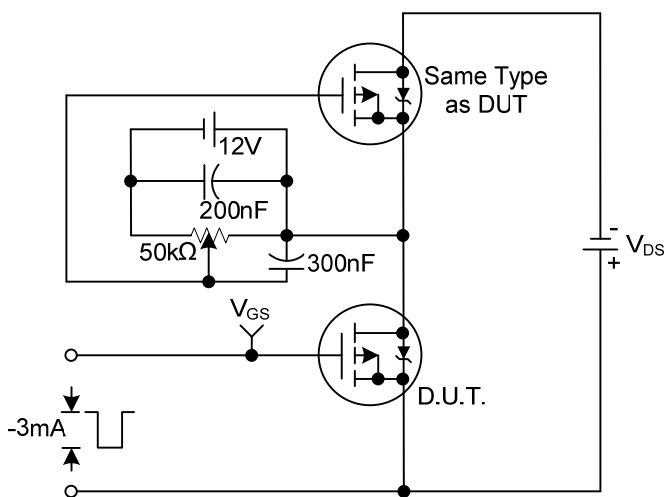


Fig.3a Gate Charge Test Circuit

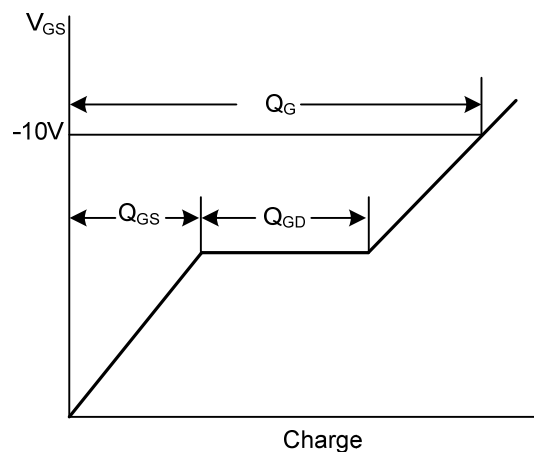
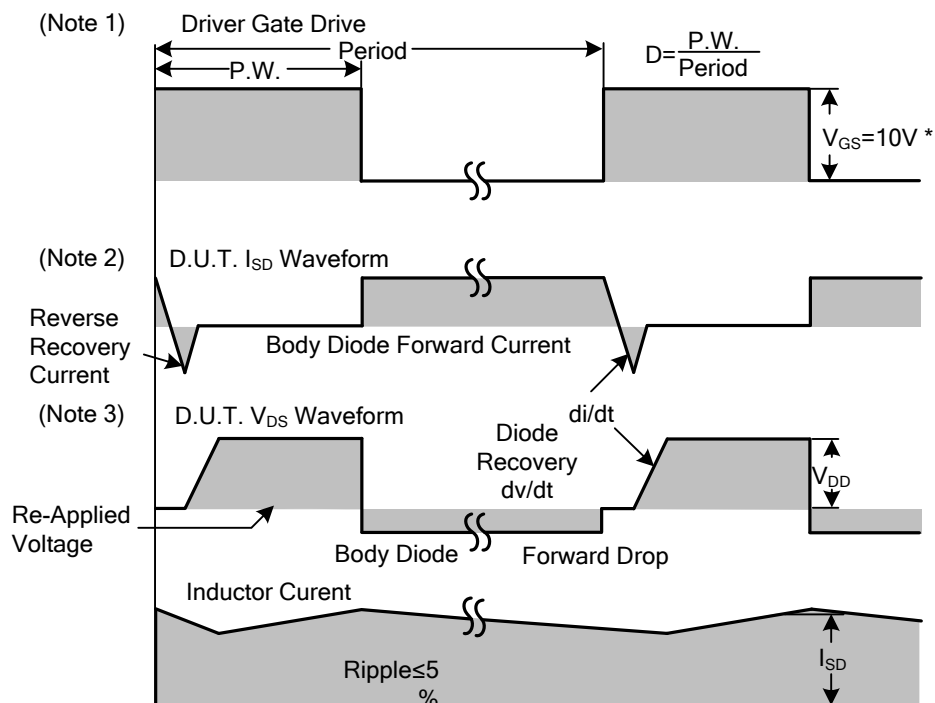
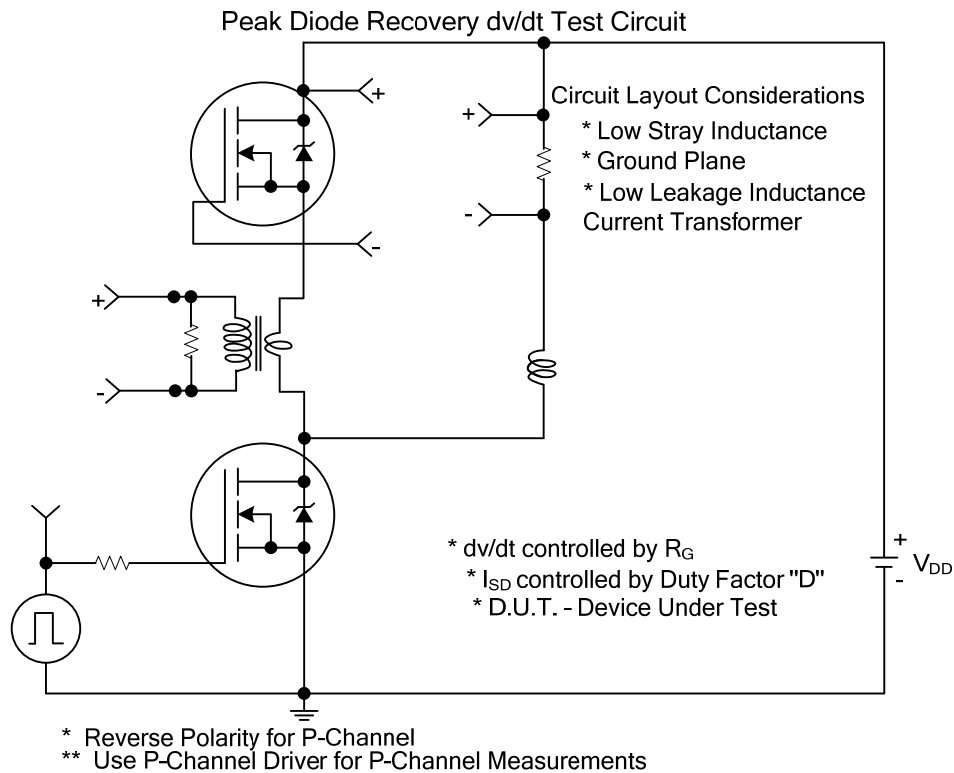


Fig. 3b Gate Charge Waveform

TEST CIRCUITS AND WAVEFORMS

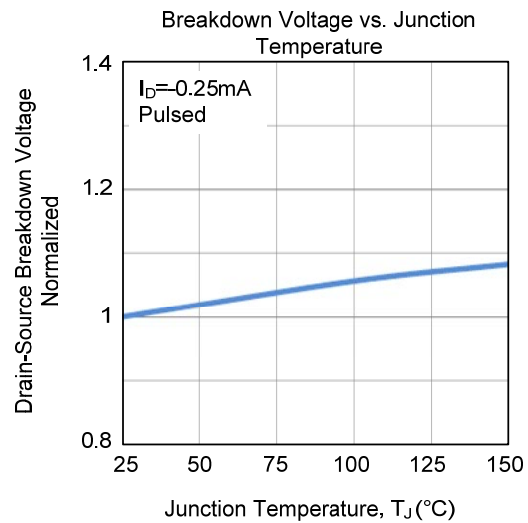
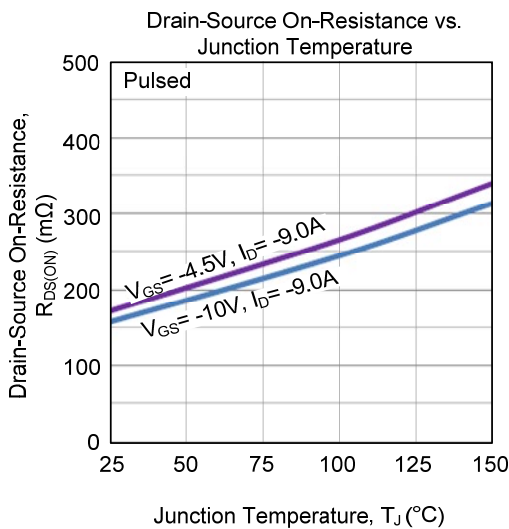
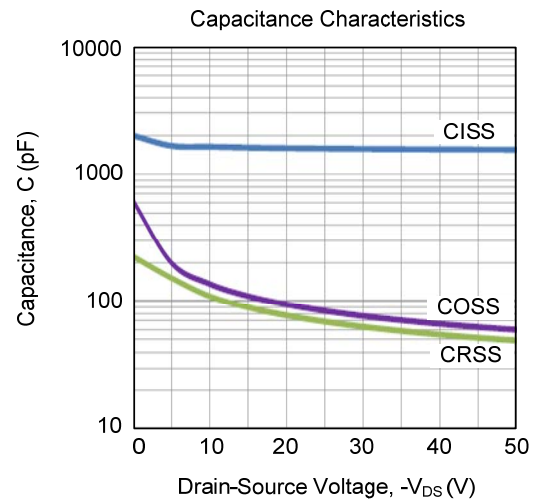
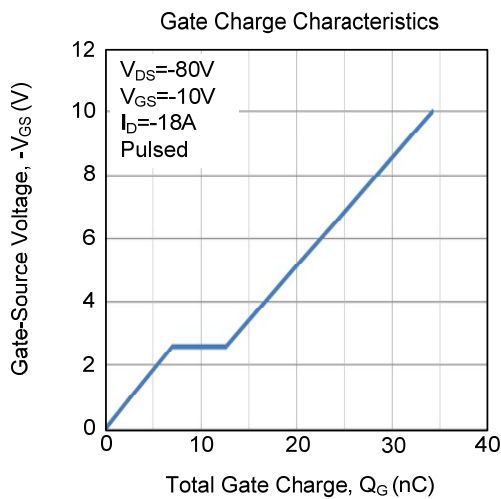
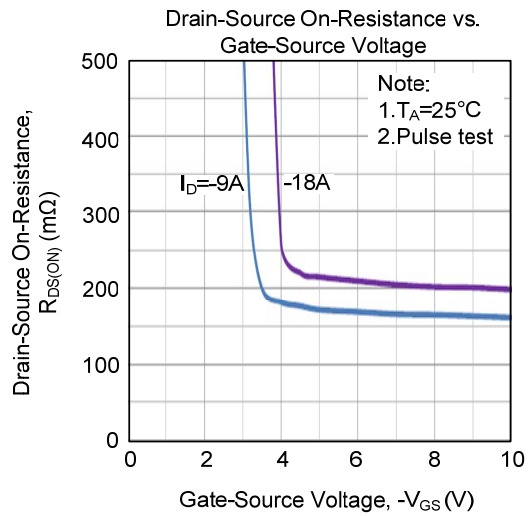
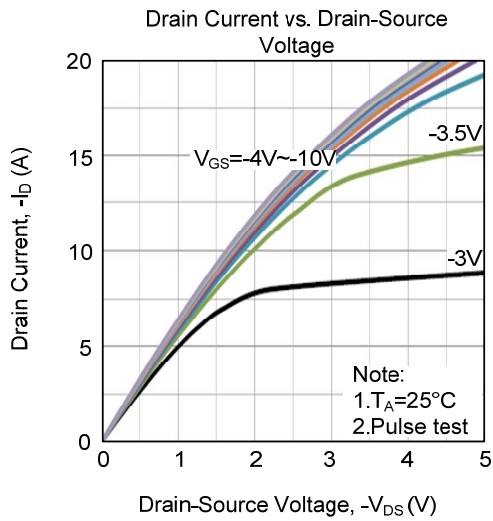


*** $V_{GS} = 5V$ for Logic Level and 3V Drive Devices

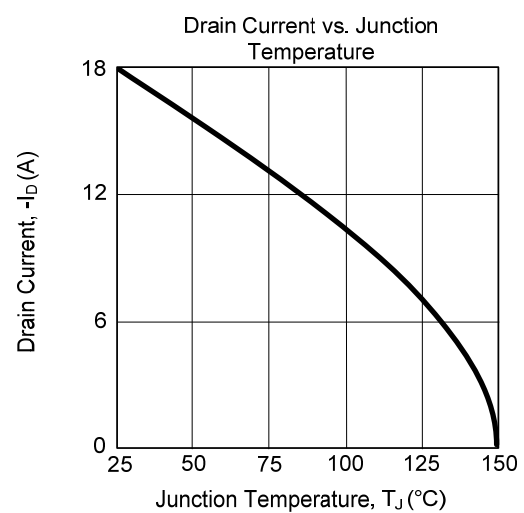
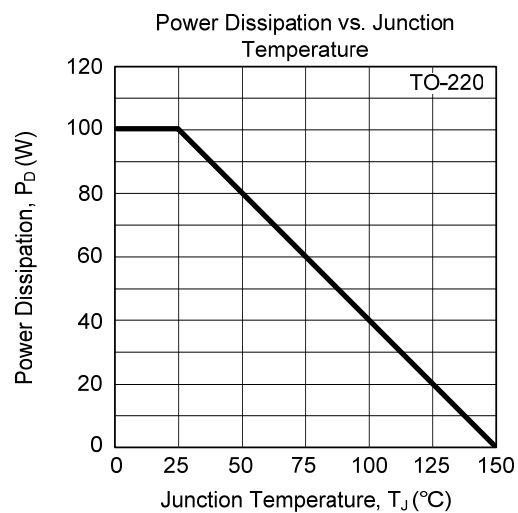
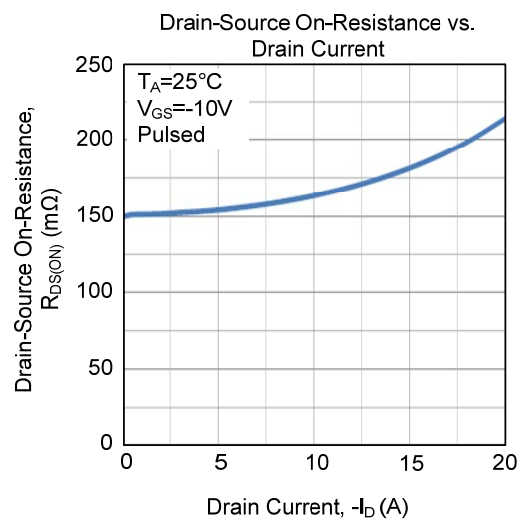
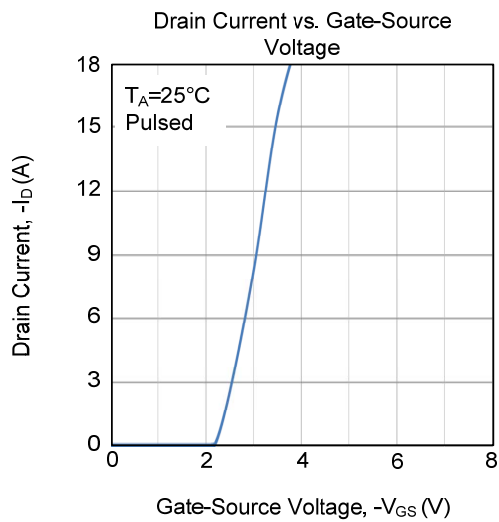
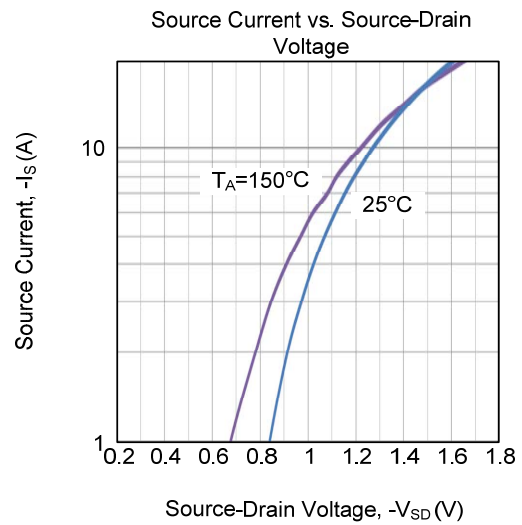
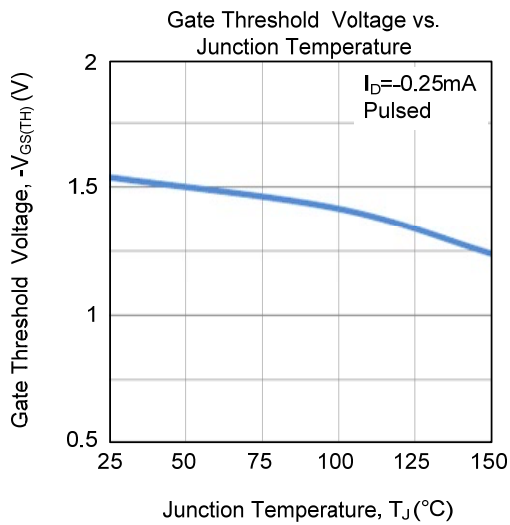
For N and P Channel Power MOSFET

- Notes: 1. Repetitive rating; pulse width limited by max. junction temperature.
 2. $V_{DD} = -25V$, starting $T_J = 25^\circ C$, $L = 2.7mH$, $R_G = 25\Omega$, $I_{AS} = -18A$. (See Figure 2)
 3. $I_{SD} \leq -18A$, $di/dt \leq 200A/\mu s$, $V_{DD} \leq BV_{DSS}$, $T_J \leq 150^\circ C$

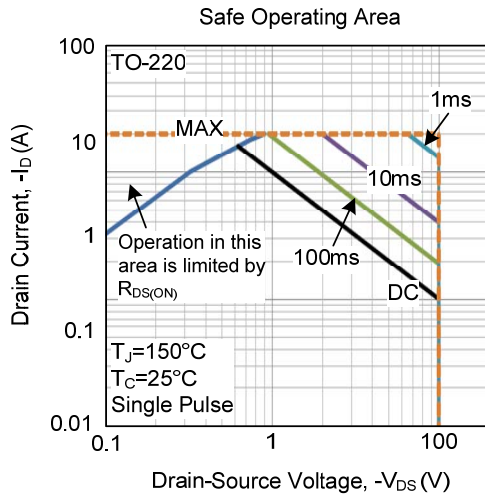
TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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