



UTT12P10

Power MOSFET

-100V, -12A P-CHANNEL POWER MOSFET

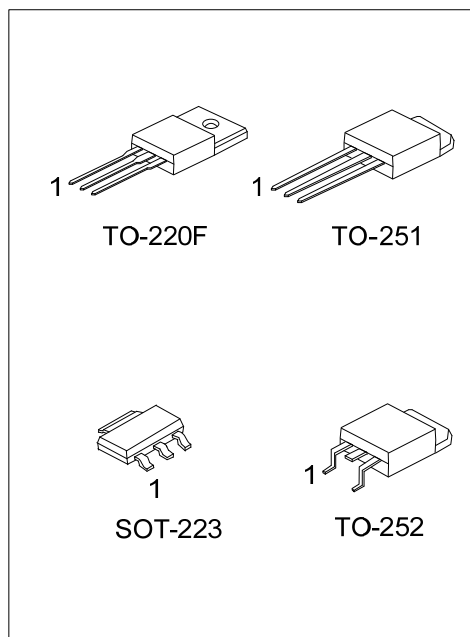
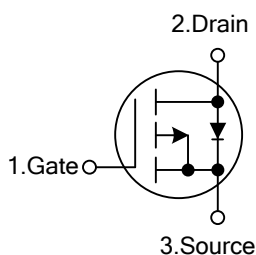
DESCRIPTION

The UTC **UTT12P10** 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

- * $R_{DS(ON)} \leq 0.2 \Omega$ @ $V_{GS} = -10V$, $I_D = -12A$
- * High Switching Speed

SYMBOL



ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UTT12P10L-AA3-R	UTT12P10G-AA3-R	SOT-223	G	D	S	Tape Reel
UTT12P10L-TF3-T	UTT12P10G-TF3-T	TO-220F	G	D	S	Tube
UTT12P10L-TM3-T	UTT12P10G-TM3-T	TO-251	G	D	S	Tube
UTT12P10L-TN3-R	UTT12P10G-TN3-R	TO-252	G	D	S	Tape Reel

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

UTT12P10G-AA3-R (1) Packing Type (2) Package Type (3) Green Package	(1) R: Tape Reel, T: Tube (2) AA3: SOT-223, TF3: TO-220F, TM3: TO-251 TN3: TO-252 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

SOT-223	TO-220F / TO-251 / TO-252
UTT12P10 L: Lead Free G: Halogen Free Date Code	UTC UTT12P10 Lot Code L: Lead Free G: Halogen Free Date Code

■ ABSOLUTE MAXIMUM RATINGS ($T_J=25^{\circ}\text{C}$, 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	-12	A
	Pulsed (Note 2)		I_{DM}	-24	A
	Single Pulsed (Note 3)		E_{AS}	18	mJ
Power Dissipation ($T_C=25^{\circ}\text{C}$)		SOT-223	P_D	2	W
		TO-220F		26	W
		TO-251		44.5	W
		TO-252			
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 max. junction temperature.
 3. $L=0.1\text{mH}$, $I_{AS}=-19.2\text{A}$, $V_{DD}=-25\text{V}$, $R_G=25\Omega$, Starting $T_J = 25^{\circ}\text{C}$

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	SOT-223	θ_{JA}	140	$^{\circ}\text{C/W}$
	TO-220F		62.5	$^{\circ}\text{C/W}$
	TO-251		110	$^{\circ}\text{C/W}$
	TO-252			
Junction to Case	SOT-223	θ_{JC}	62.5	$^{\circ}\text{C/W}$
	TO-220F		4.81	$^{\circ}\text{C/W}$
	TO-251		2.8	$^{\circ}\text{C/W}$
	TO-252			

Note: Repetitive rating; pulse width limited by max. junction temperature.

■ ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$, 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	I _{GSS}	V _{GS} =+20V			+100	nA
	Reverse		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-State Resistance		R _{DS(ON)}	V _{GS} =-10V, I _D =-12A (Note 2)			0.2	Ω
DYNAMIC PARAMETERS							
Input Capacitance		C _{ISS}	V _{DS} =-25V, V _{GS} =0V, f=1.0MHz		1250		pF
Output Capacitance		C _{OSS}			70		pF
Reverse Transfer Capacitance		C _{RSS}			60		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =-80V, V _{GS} =-10V, I _D =-12A		31		nC
Gate to Source Charge		Q _{GS}			5		nC
Gate to Drain ("Miller") Charge		Q _{GD}			8		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =-50V, I _D =-12A, R _G =9.1Ω,		6		ns
Rise Time		t _R			18		ns
Turn-OFF Delay Time		t _{D(OFF)}			45		ns
Fall-Time		t _F			21		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I _S				-12	A
Maximum Body-Diode Pulsed Current		I _{SM}	(Note 1)			-24	A
Drain-Source Diode Forward Voltage		V _{SD}	T _J =25°C, I _S =-12A, V _{GS} =0V(Note 2)			-5.0	V
Body Diode Reverse Recovery Time		t _{rr}	T _J =25°C, I _F =-12A,		130		ns
Body Diode Reverse Recovery Charge		Q _{rr}	di/dt=100A/μs (Note 2)		0.56		μC

Notes: 1. Repetitive rating; pulse width limited by max. junction temperature.

2. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.

■ TEST CIRCUITS AND WAVEFORMS

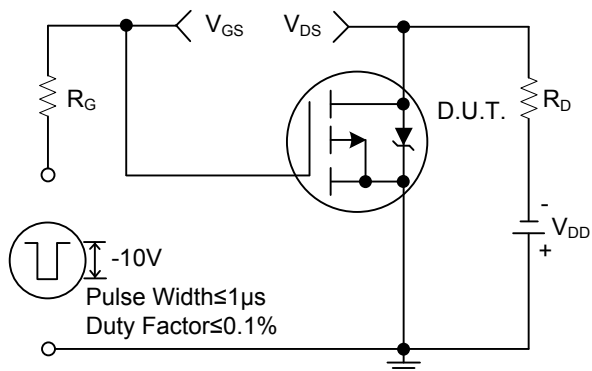


Fig. 1a Switching Time Test Circuit

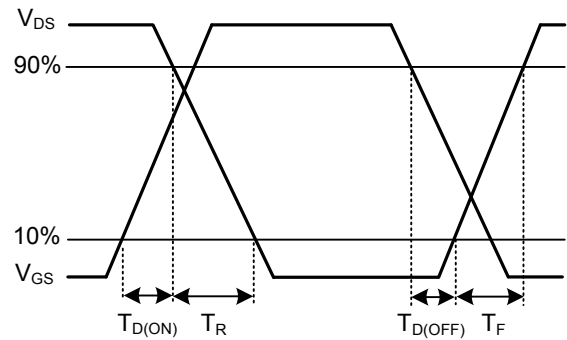


Fig. 1b Switching Time Waveforms

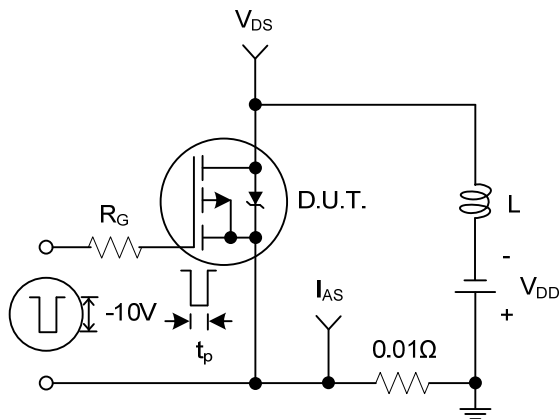


Fig. 2a Unclamped Inductive Test Circuit

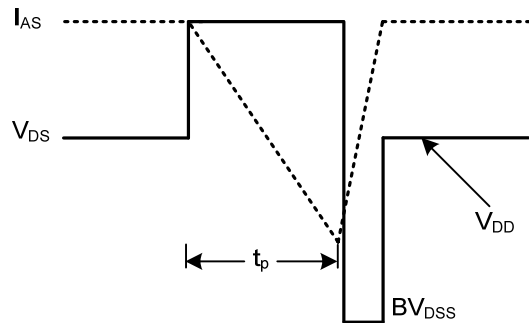


Fig. 2b Unclamped Inductive Waveforms

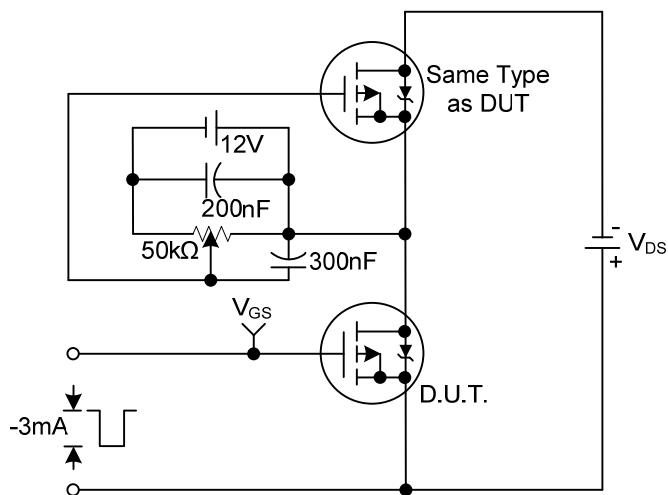


Fig. 3a Gate Charge Test Circuit

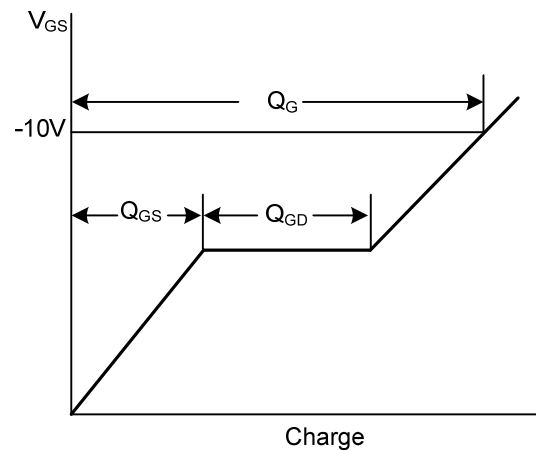
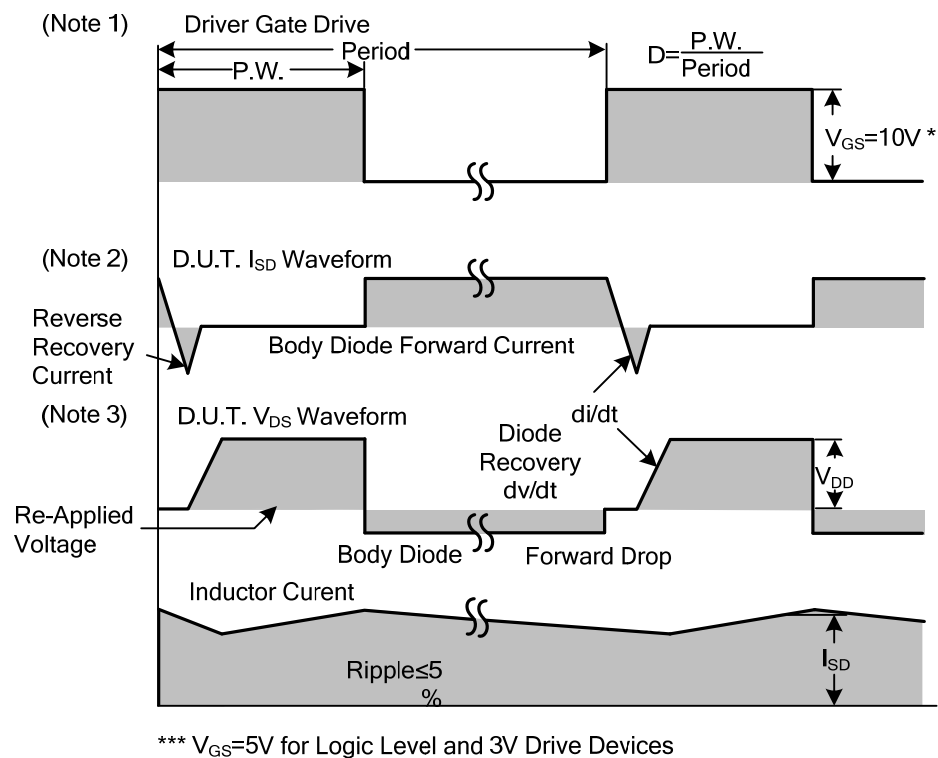
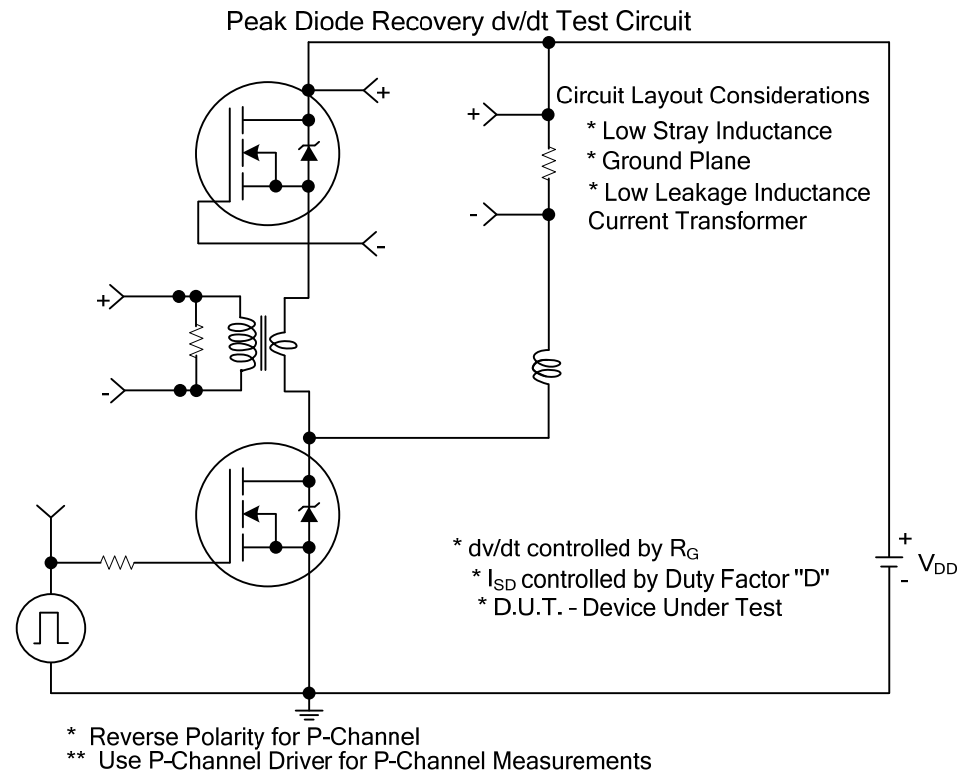


Fig. 3b Gate Charge Waveform

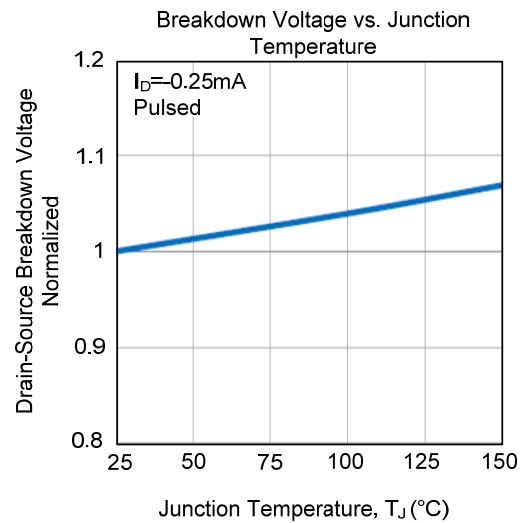
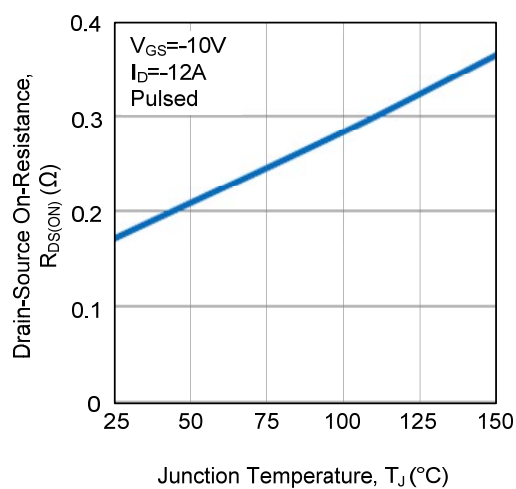
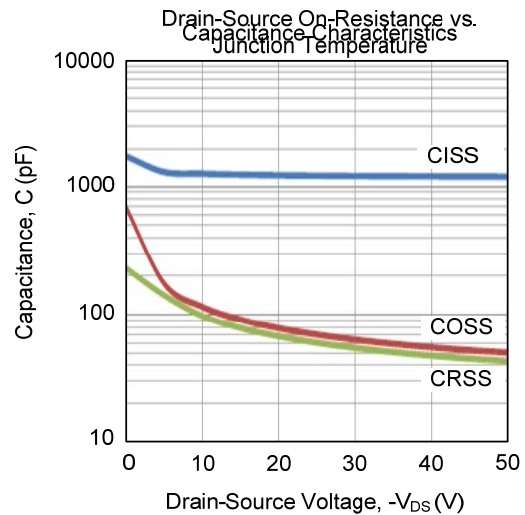
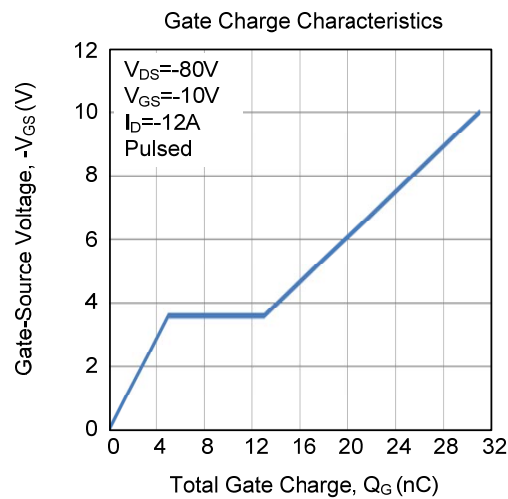
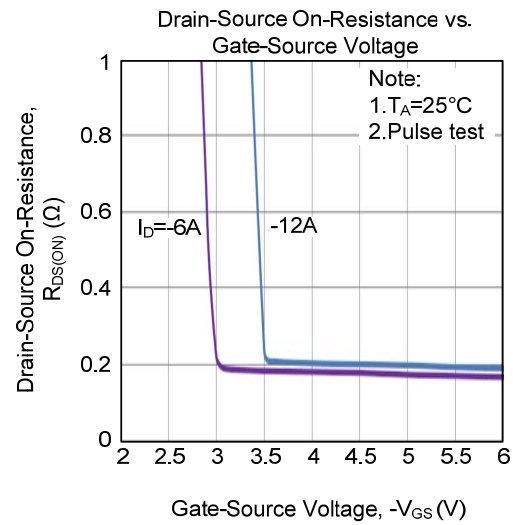
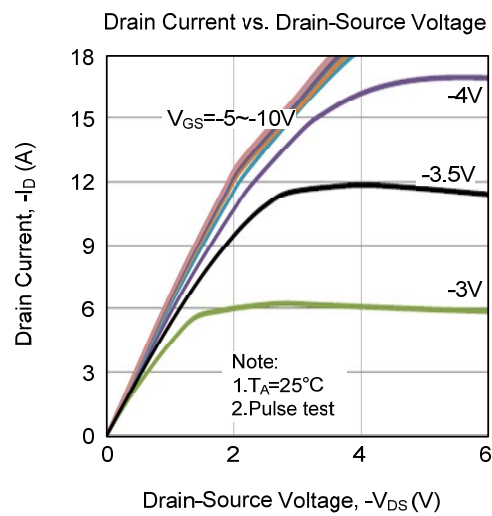
■ TEST CIRCUITS AND WAVEFORMS



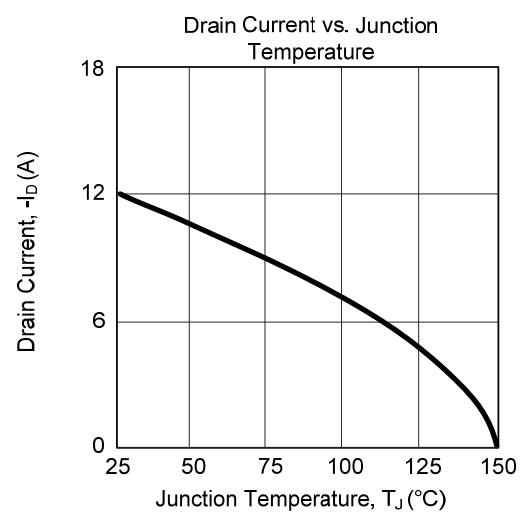
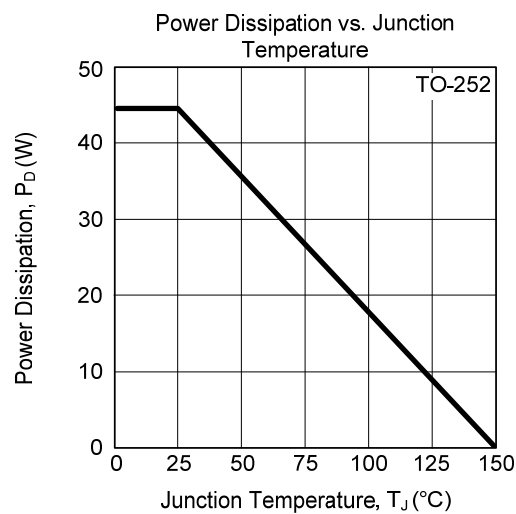
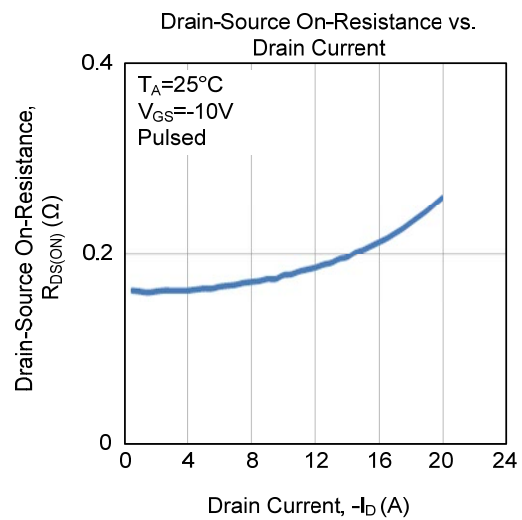
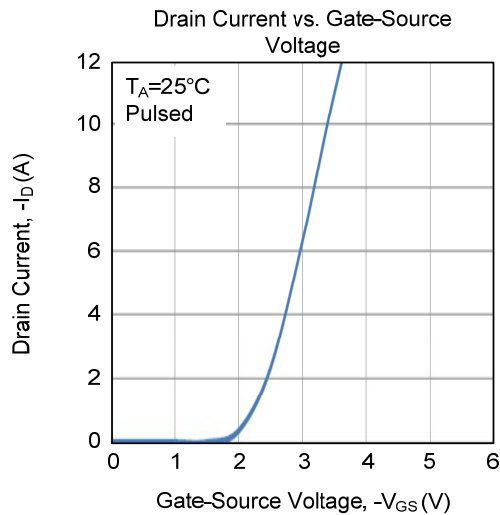
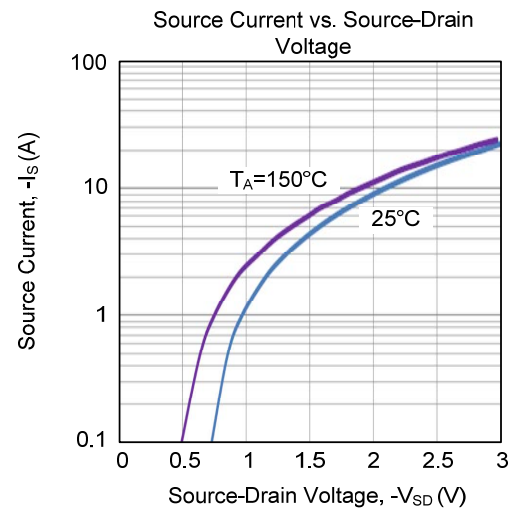
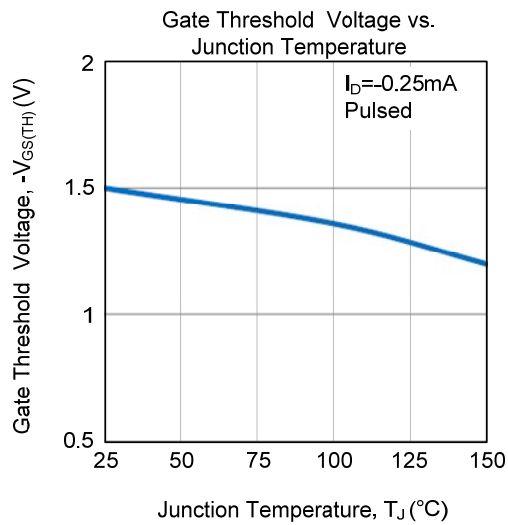
For N and P Channel Power MOSFET

- Notes: 1. Repetitive rating; pulse width limited by max. junction temperature.
 2. $V_{DD}=-25V$, starting $T_J=25^\circ C$, $L=2.7mH$, $R_G=25\Omega$, $I_{AS}=-12A$. (See Figure 2)
 3. $I_{SD}\leq -12A$, $di/dt\leq 200A/\mu s$, $V_{DD}\leq BV_{DSS}$, $T_J\leq 175^\circ C$

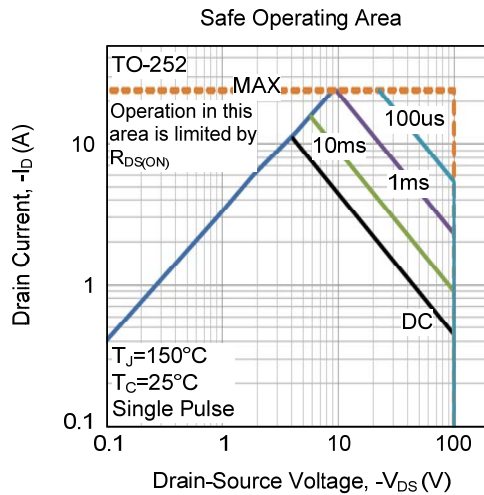
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



TYPICAL CHARACTERISTICS (Cont.)



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