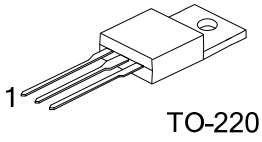
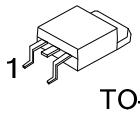
17P10-Q

Power MOSFET

-17A, -100V P-CHANNEL POWER MOSFET



TO-220



TO-252

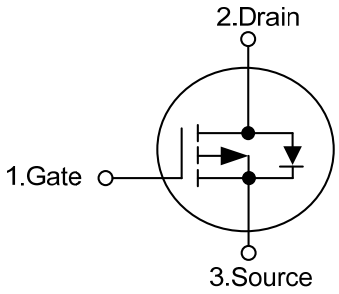
■ DESCRIPTION

The **17P10-Q** uses advanced proprietary, planar stripe, DMOS technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable to be used in low voltage applications such as audio amplifier, high efficiency switching DC/DC converters, and DC motor control.

■ FEATURES

* $R_{DS(ON)} \leq 0.2\ \Omega$ @ V_{GS}=-10V, I_D=-8.5A
* Low capacitance
* Low gate charge
* Fast switching capability
* Avalanche energy specified

■ SYMBOL



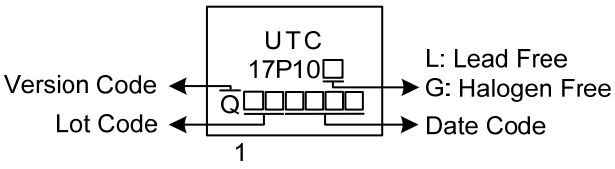
■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
17P10L-TA3-T	17P10G-TA3-T	TO-220	G	D	S	Tube
17P10L-TN3-R	17P10G-TN3-R	TO-252	G	D	S	Tape Reel

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

17P10G-TA3-T (1)Packing Type (2)Package Type (3)Green Package	(1) T: Tube, R: Tape Reel (2) TA3: TO-220, TN3: TO-252 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING


UTC
17P10□
Q□□□□□□
Version Code
Lot Code
1
L: Lead Free
G: Halogen Free
Date Code

■ 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}	±30	V
Continuous Drain Current		I_D	-17	A
Pulsed Drain Current (Note 2)		I_{DM}	-51	A
Avalanche Current (Note 2)		I_{AR}	-17	A
Single Pulsed Avalanche Energy (Note 3)		E_{AS}	95	mJ
Peak Diode Recovery dv/dt		dv/dt	8.3	V/ns
Power Dissipation	TO-220	P_D	100	W
	TO-252		45	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 = 1mH, I_{AS} = -13.75A, V_{DD} = -50V, R_G = 25Ω, Starting T_J = 25°C
4. I_{SD} ≤ -17A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220	θ_{JA}	62.5	°C/W
	TO-252		110	°C/W
Junction to Case	TO-220	θ_{JC}	1.25	°C/W
	TO-252		2.7	°C/W

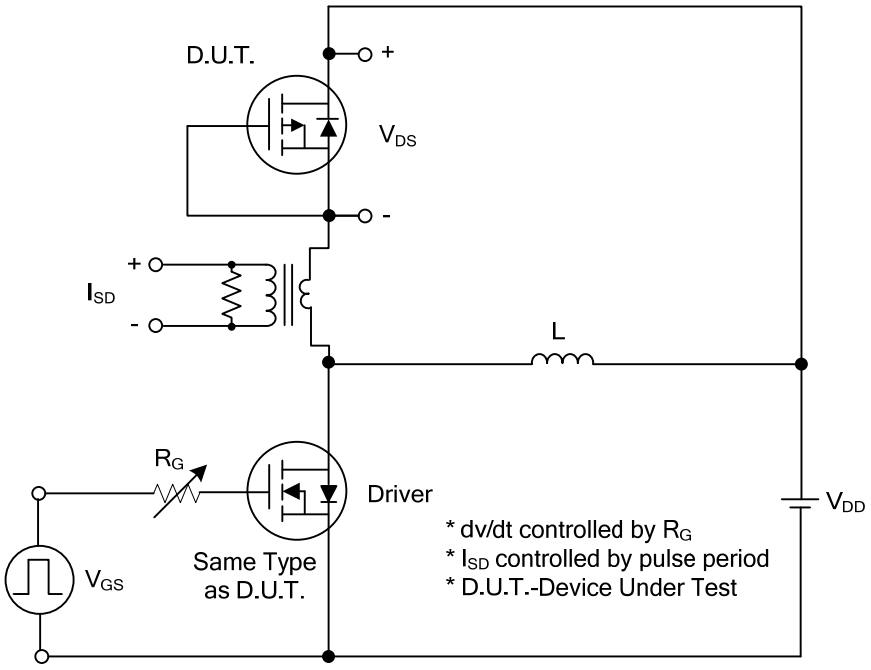
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

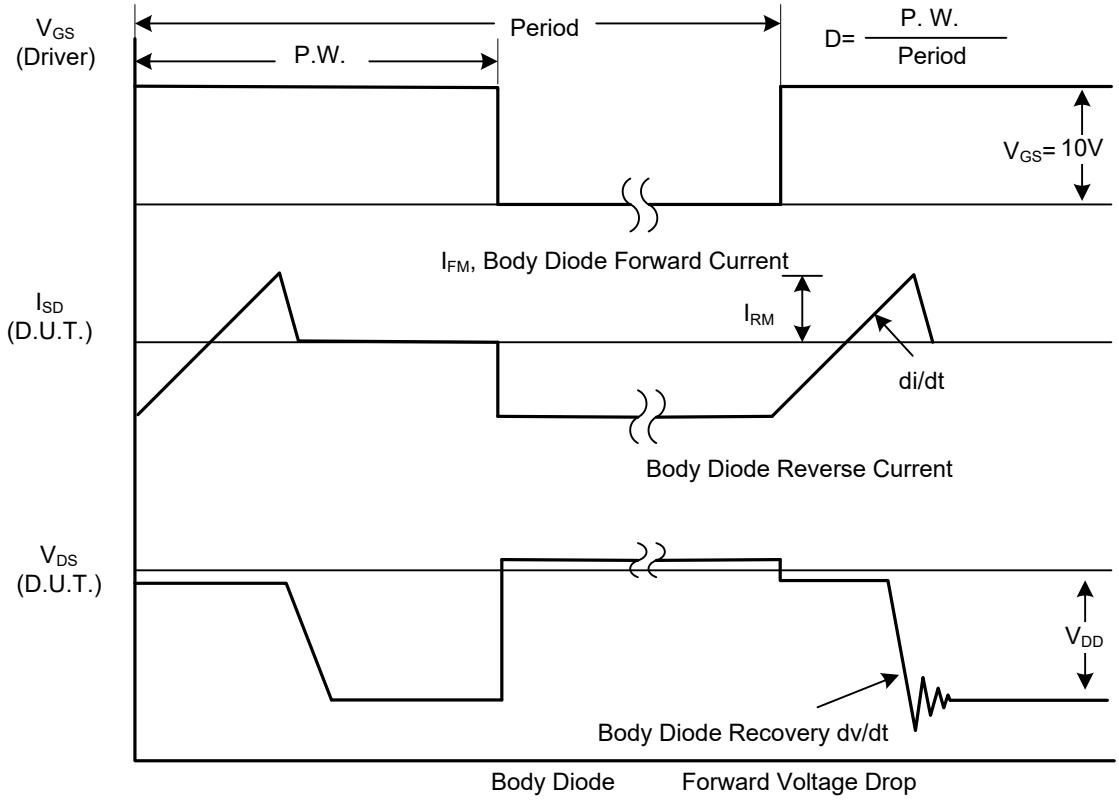
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-100			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-100V, V_{GS}=0V			-1	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±30V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=-250μA	-2.0		-4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-8.5A			0.2	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=-25V, V_{GS}=0V, f=1.0MHz		700		pF
Output Capacitance	C_{OSS}			201		pF
Reverse Transfer Capacitance	C_{RSS}			41		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS}=-80V, V_{GS}=-10V, I_D=-17A, (Note 1, 2)		24		nC
Gate Source Charge	Q_{GS}			9		nC
Gate Drain Charge	Q_{GD}			6		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD}=-50V, V_{GS}=-10V, I_D=-17A, R_G=3.3Ω (Note 1, 2)		7		ns
Turn-ON Rise Time	t_R			18		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			19		ns
Turn-OFF Fall-Time	t_F			17		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Body-Diode Continuous Current	I_S				-17	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				-51	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-17A			-5	V
Body Diode Reverse Recovery Time	t_{rr}	V_{GS}= 0V, I_S=-17A, dI_F/dt=100A/μs (Note 1)		163		ns
Body Diode Reverse Recovery Charge	Q_{rr}			0.66		μC

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

■ TEST CIRCUITS AND WAVEFORMS

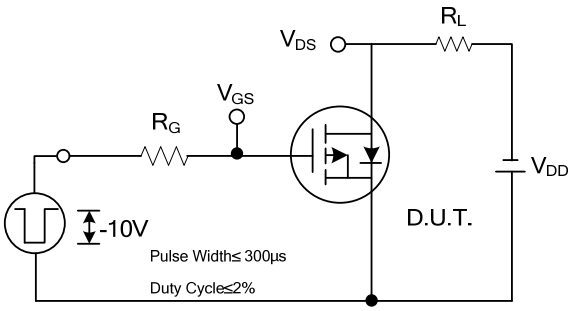


Peak Diode Recovery dv/dt Test Circuit

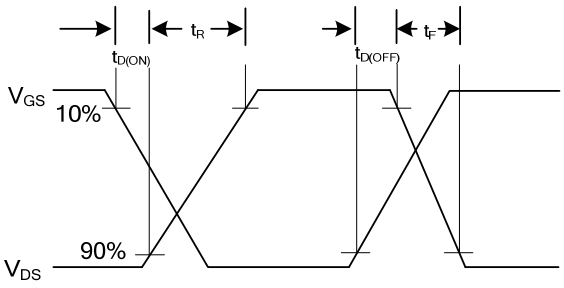


Peak Diode Recovery dv/dt Waveforms

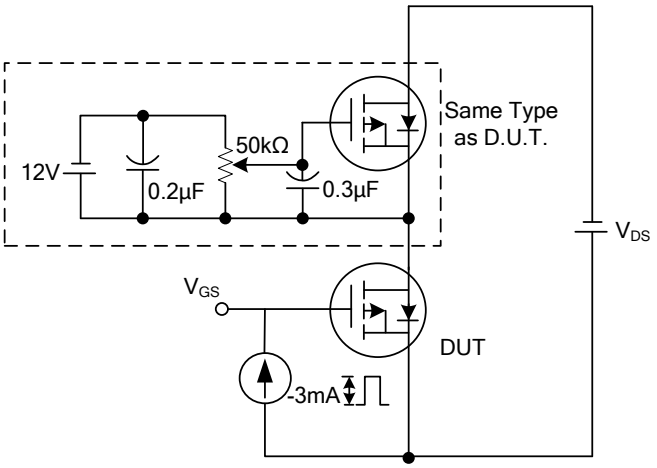
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



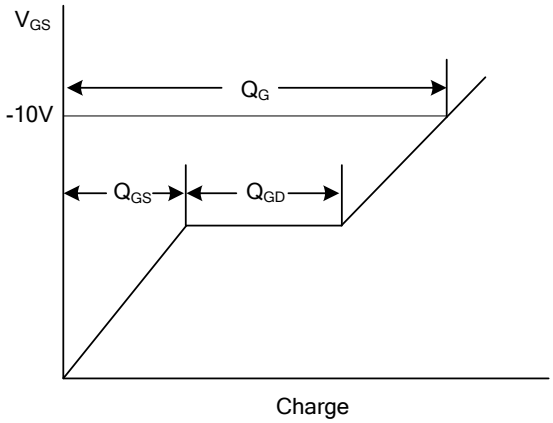
Switching Test Circuit



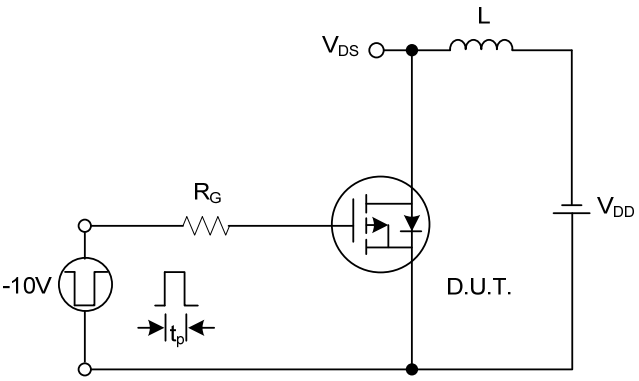
Switching Waveforms



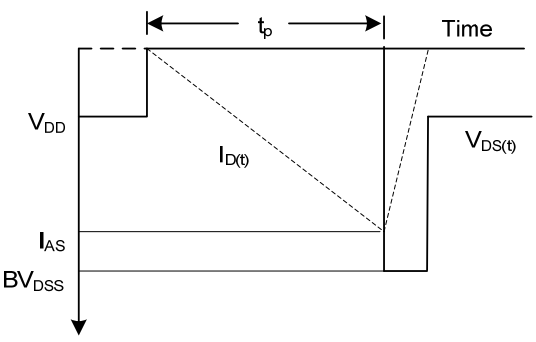
Gate Charge Test Circuit



Gate Charge Waveform

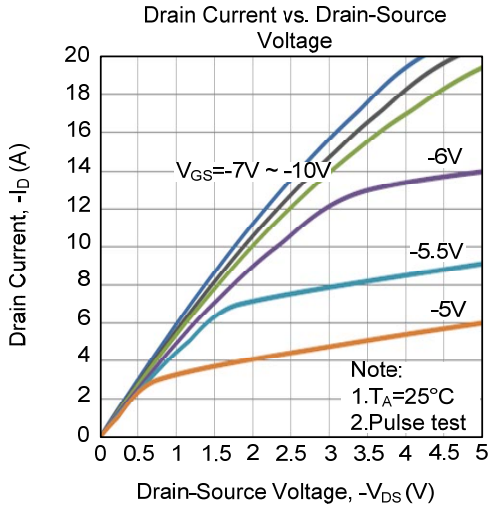


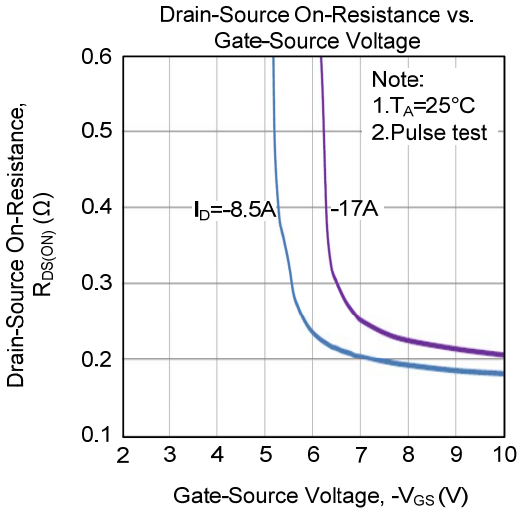
Unclamped Inductive Switching Test Circuit

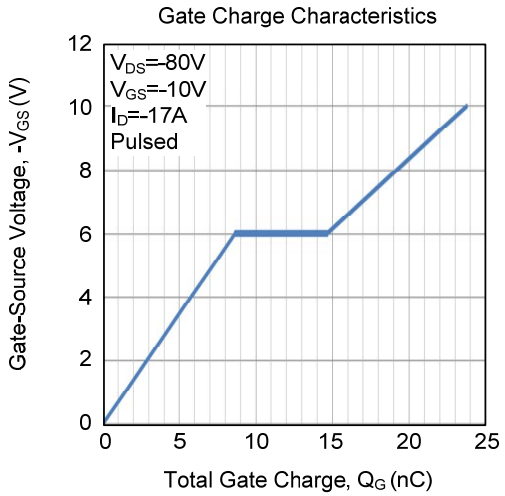


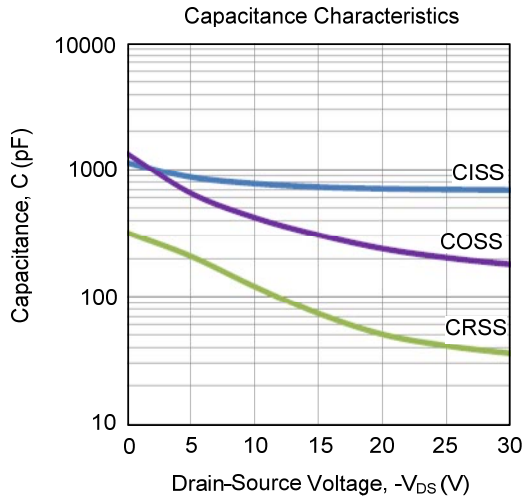
Unclamped Inductive Switching Waveforms

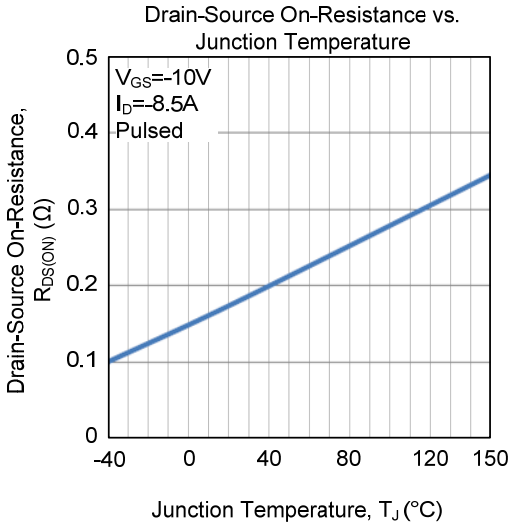
■ TYPICAL CHARACTERISTICS

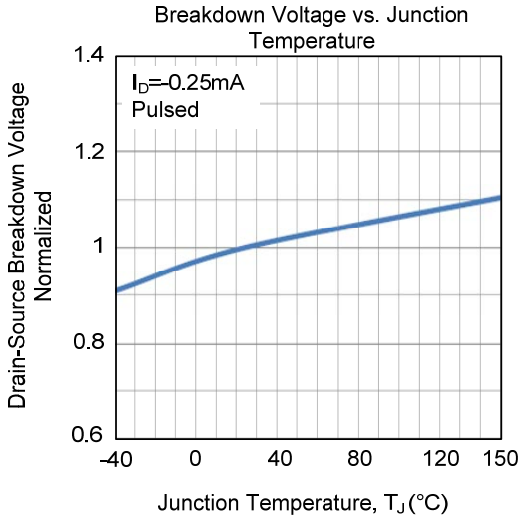




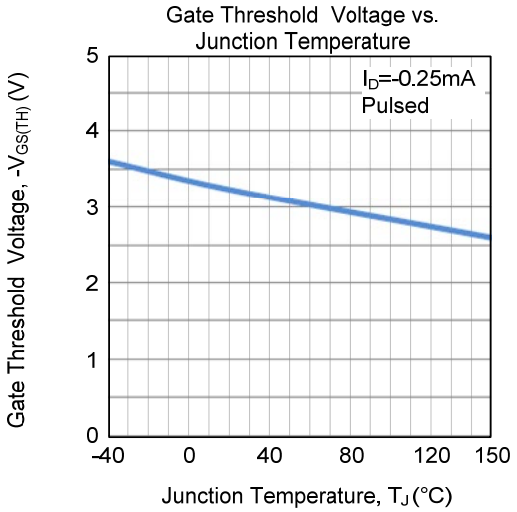


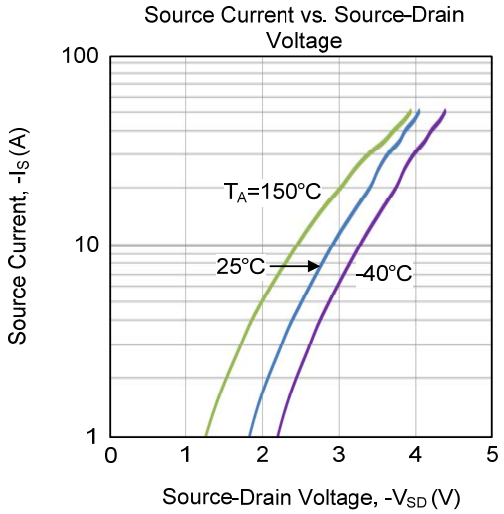


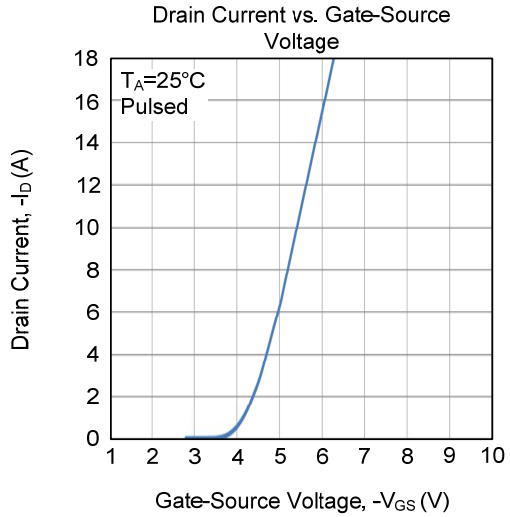


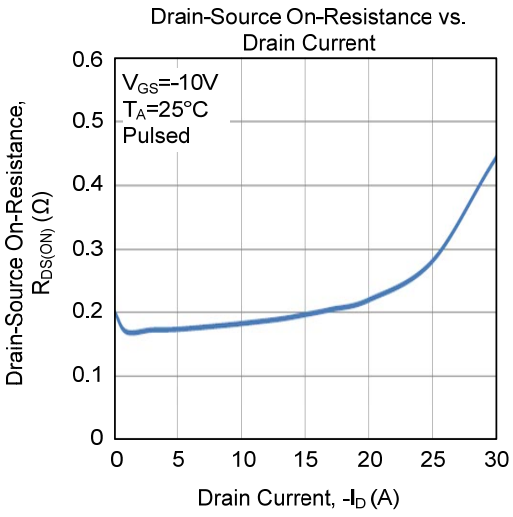


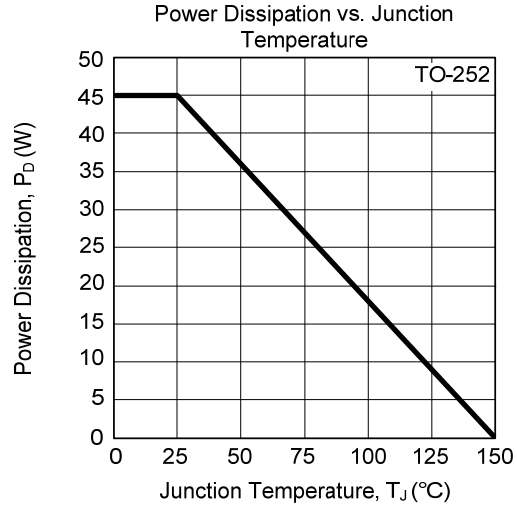
■ TYPICAL CHARACTERISTICS (Cont.)

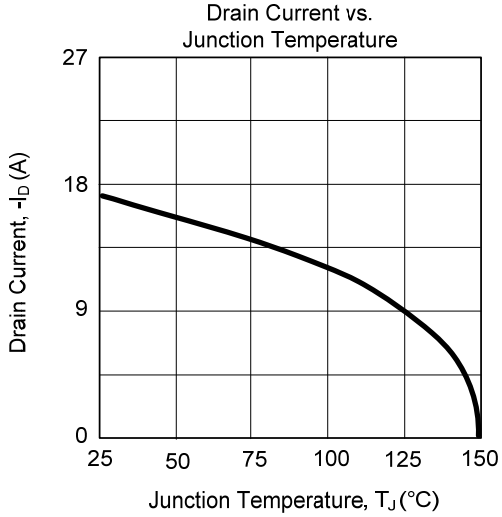












■ TYPICAL CHARACTERISTICS (Cont.)