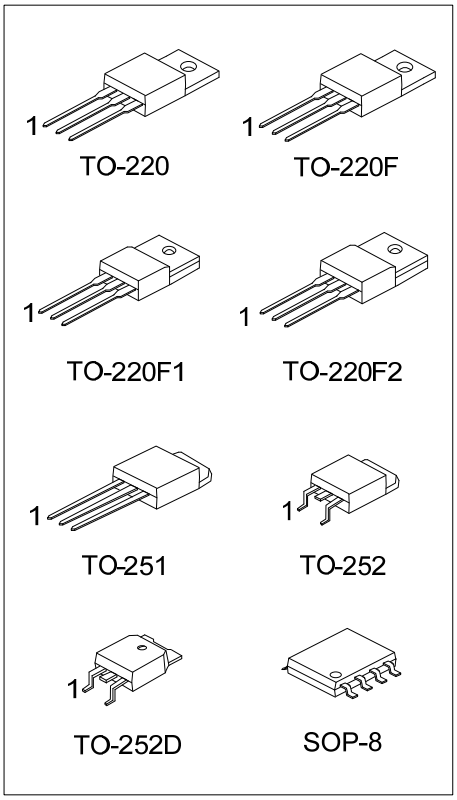
17P10-HC

Power MOSFET

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



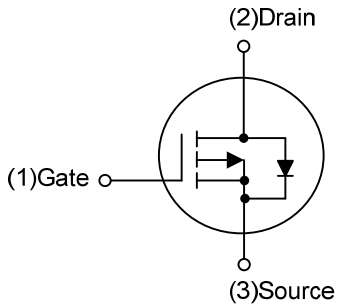
■ DESCRIPTION

The **17P10-HC** 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.

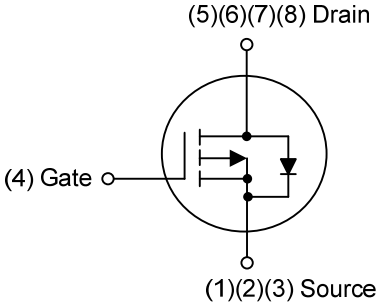
■ FEATURES

* $R_{DS(ON)} \leq 0.15\ \Omega$ @ V_{GS}=-10V, I_D=-8.5A
* Low capacitance
* Low gate charge
* Fast switching capability
* Avalanche energy specified

■ SYMBOL



TO-220/TO-220F/TO-220F1
TO-220F2/TO-251/TO-252/TO-252D

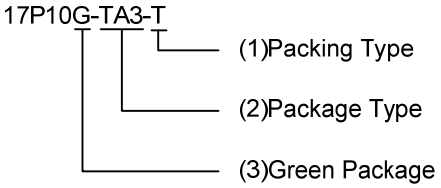


SOP-8

■ ORDERING INFORMATION

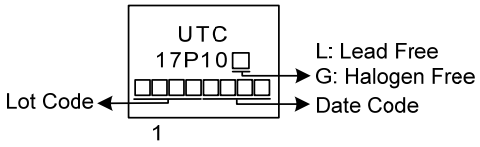
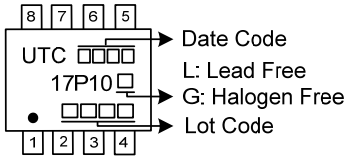
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
17P10L-TA3-T	17P10G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
17P10L-TF1-T	17P10G-TF1-T	TO-220F1	G	D	S	-	-	-	-	-	Tube
17P10L-TF2-T	17P10G-TF2-T	TO-220F2	G	D	S	-	-	-	-	-	Tube
17P10L-TF3-T	17P10G-TF3-T	TO-220F	G	D	S	-	-	-	-	-	Tube
17P10L-TM3-T	17P10G-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
17P10L-TN3-R	17P10G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
17P10L-TND-R	17P10G-TND-R	TO-252D	G	D	S	-	-	-	-	-	Tape Reel
17P10L-S08-R	17P10G-S08-R	SOP-8	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, TM3: TO-251, TN3: TO-252 TND: TO-252D, S08: SOP-8
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

TO-220 / TO-220F / TO-220F1 TO-220F2 / TO-251 / TO-252 / TO-252D	SOP-8
	

■ 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
Continuous Drain Current		I_D	-17	A
Pulsed Drain Current (Note 2)		I_{DM}	-68	A
Avalanche Current (Note 2)		I_{AR}	-17	A
Single Pulsed Avalanche Energy (Note 3)		E_{AS}	135	mJ
Peak Diode Recovery dv/dt		dv/dt	2.4	V/ns
Power Dissipation	TO-220	P_D	120	W
	TO-220F/TO-220F1 TO-220F2		42	W
	TO-251/TO-252 TO-252D		52	W
	SOP-8		10	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=0.1mH, I_{AS}=-51.9A, V_{DD}=-50V, R_G=25Ω, Starting T_J=25°C
4. I_{SD}≤-17A, di/dt ≤ 200μA/ s, V_{DD}≤BV_{DSS}, Starting T_J=25°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F TO-220F1/TO-220F2	θ_{JA}	62.5	°C/W
	TO-251/TO-252 TO-252D		110	°C/W
	SOP-8		125	°C/W
Junction to Case	TO-220	θ_{JC}	1.04	°C/W
	TO-220F/TO-220F1 TO-220F2		2.97	°C/W
	TO-251/TO-252 TO-252D		2.4 (Note)	°C/W
	SOP-8		12.5 (Note)	°C/W

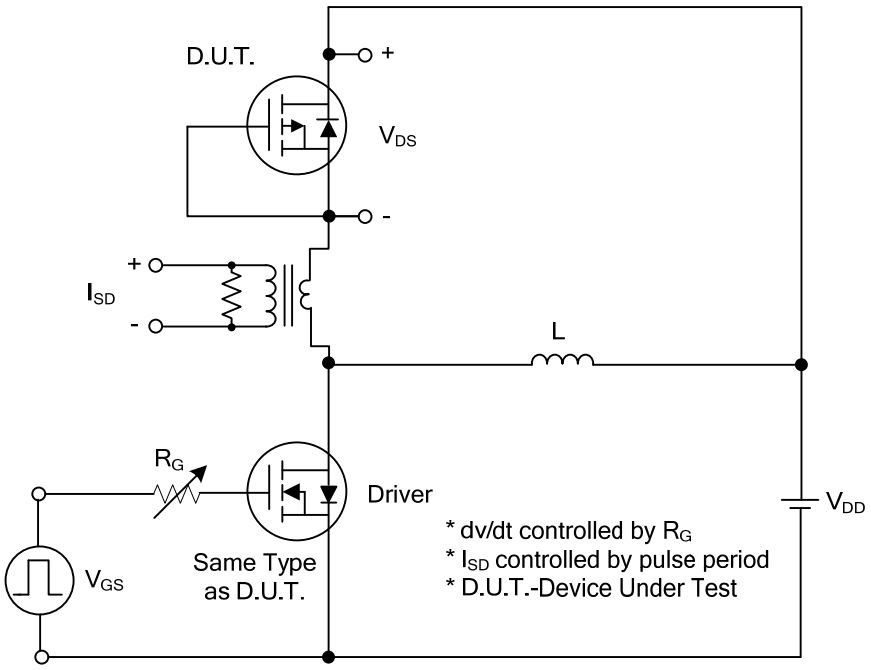
Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

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

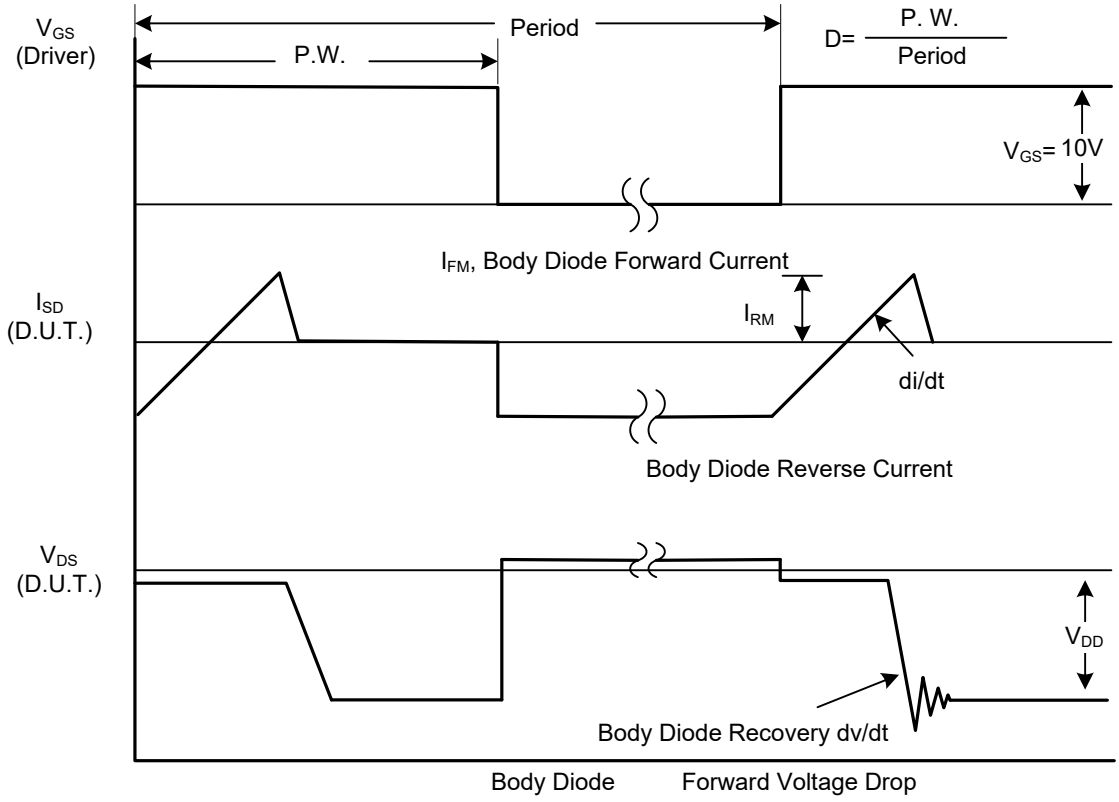
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0 V, I_D=-250μA	-100			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-100V, V_{GS}=0V			-1	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
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			0.15	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{DS}=-25V, V_{GS}=0V, f=1.0MHz		1250		pF
Output Capacitance	C_{OSS}			450		pF
Reverse Transfer Capacitance	C_{RSS}			130		pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{DS}=-50V, V_{GS}=-10V, I_D=-17A I_G=-1mA (Note 1, 2)		38		nC
Gate Source Charge	Q_{GS}			4.2		nC
Gate Drain Charge	Q_{GD}			13		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD}=-50V, V_{GS}=-10V, I_D=-17A, R_G=10Ω (Note 1, 2)		10		ns
Turn-ON Rise Time	t_R			22		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			61		ns
Turn-OFF Fall-Time	t_F			32		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}				-68	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-17A			-6	V
Body Diode Reverse Recovery Time	t_{rr}	V_{GS}= 0V, I_S=-17A, dI_F/dt=100A/μs (Note 1)		75		ns
Body Diode Reverse Recovery Charge	Q_{rr}			0.25		μS

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

■ TEST CIRCUITS AND WAVEFORMS

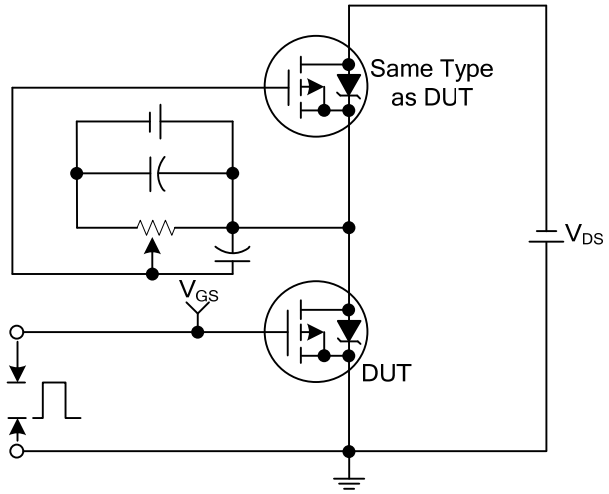


Peak Diode Recovery dv/dt Test Circuit

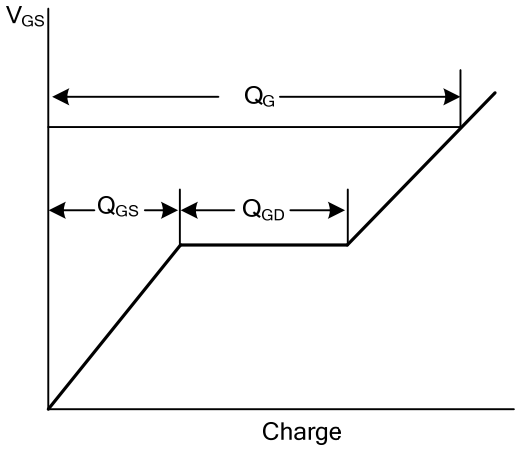


Peak Diode Recovery dv/dt Waveforms

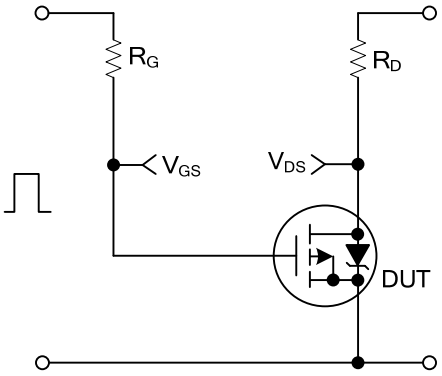
■ TEST CIRCUITS AND WAVEFORMS



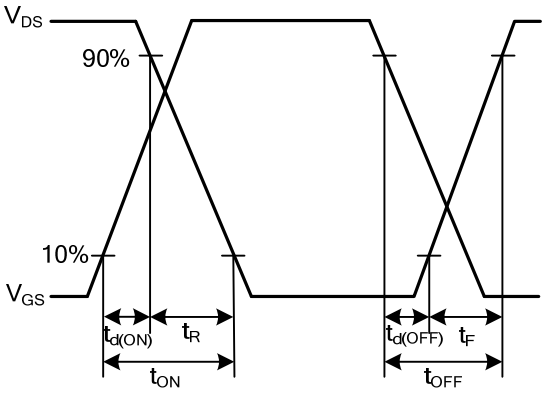
Gate Charge Test Circuit



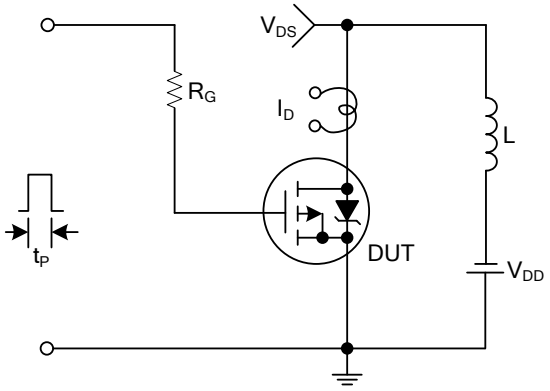
Gate Charge Waveforms



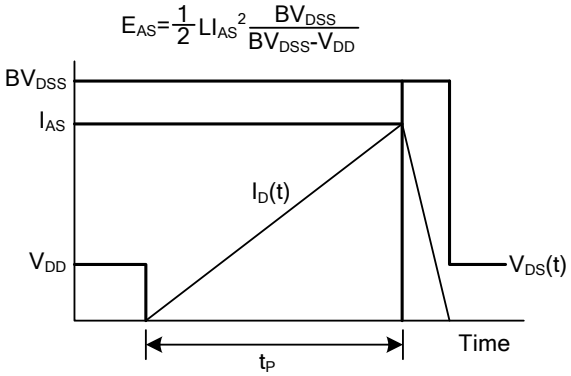
Resistive Switching Test Circuit



Resistive Switching Waveforms



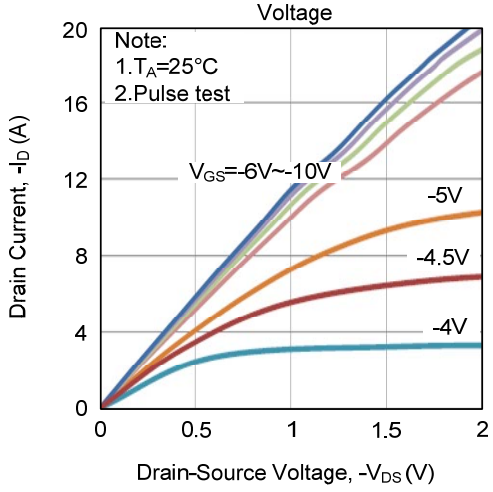
Unclamped Inductive Switching Test Circuit



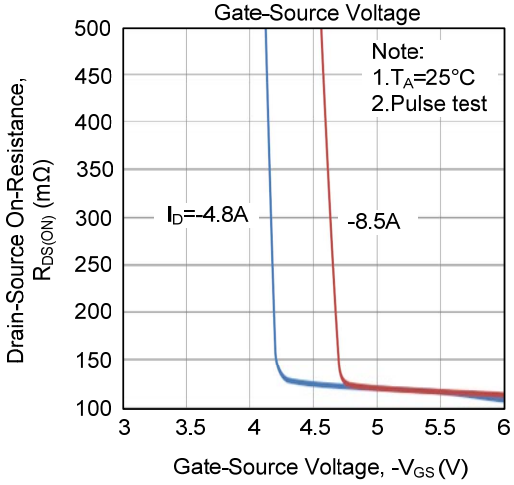
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

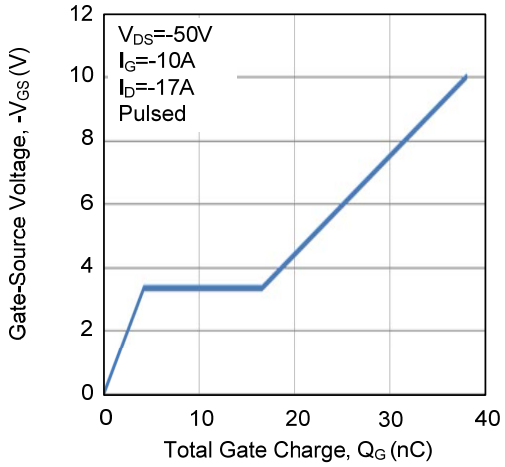
Drain Current vs. Drain-Source Voltage



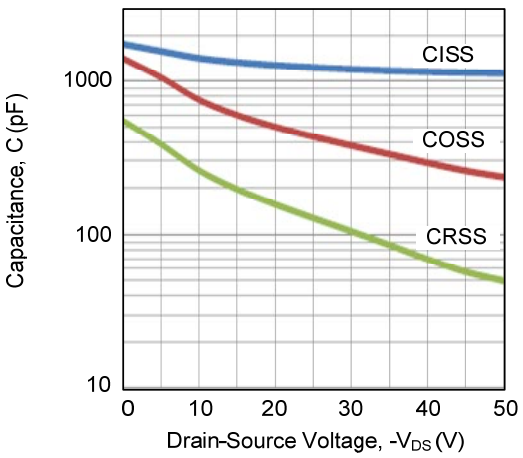
Drain-Source On-Resistance vs. Gate-Source Voltage



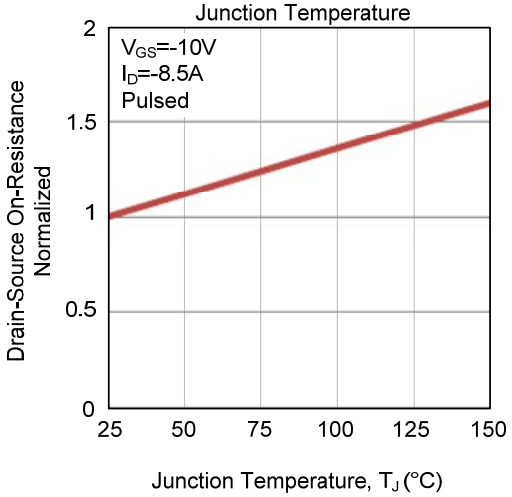
Gate Charge Characteristics



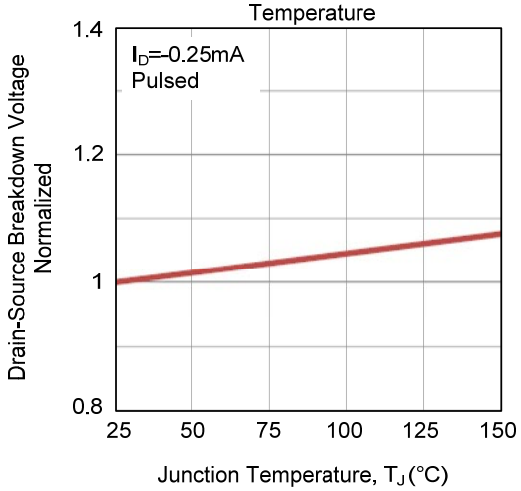
Capacitance Characteristics



Drain-Source On-Resistance vs. Junction Temperature

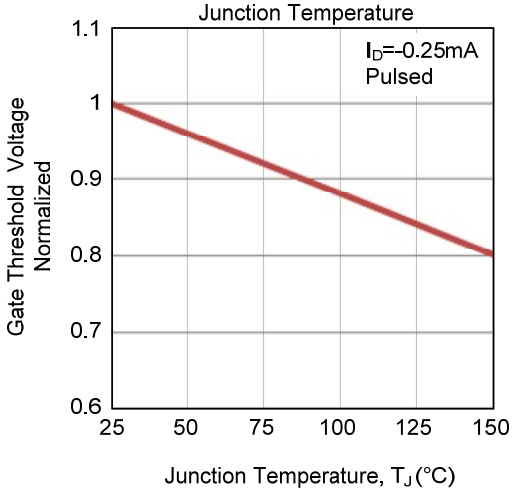


Breakdown Voltage vs. Junction Temperature

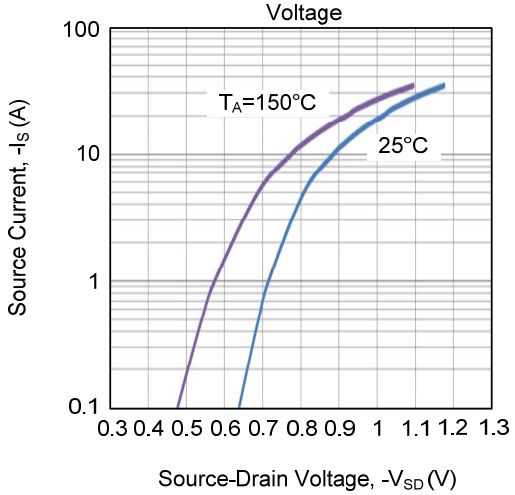


■ TYPICAL CHARACTERISTICS (Cont.)

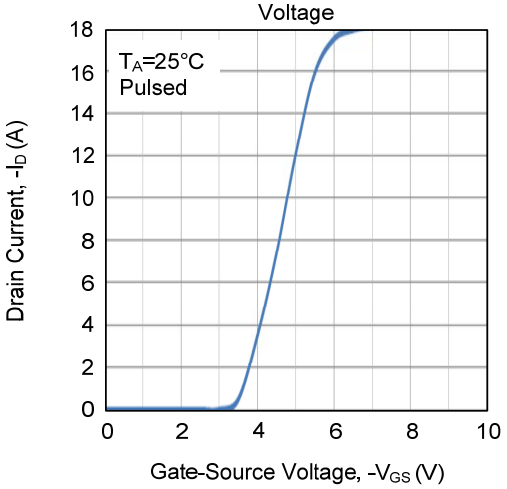
Gate Threshold Voltage vs. Junction Temperature



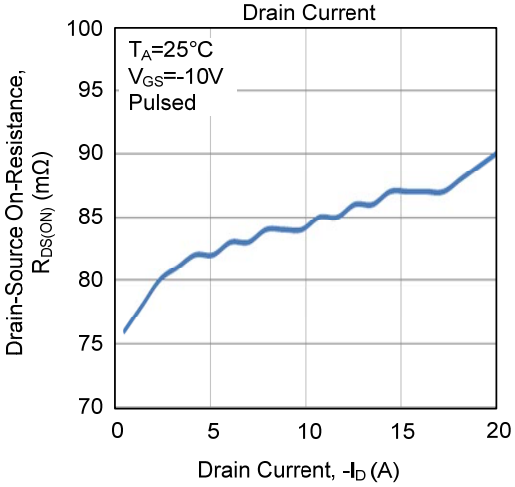
Source Current vs. Source-Drain Voltage



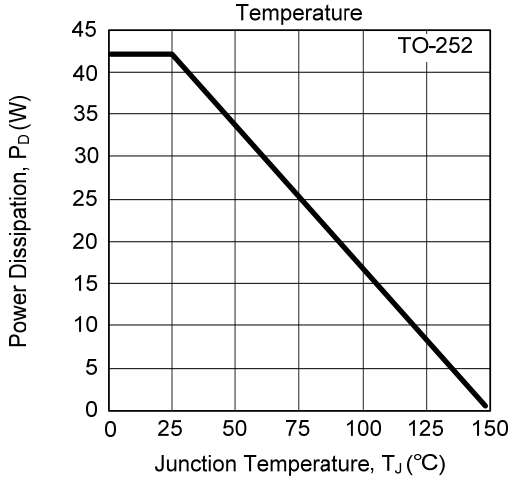
Drain Current vs. Gate-Source Voltage



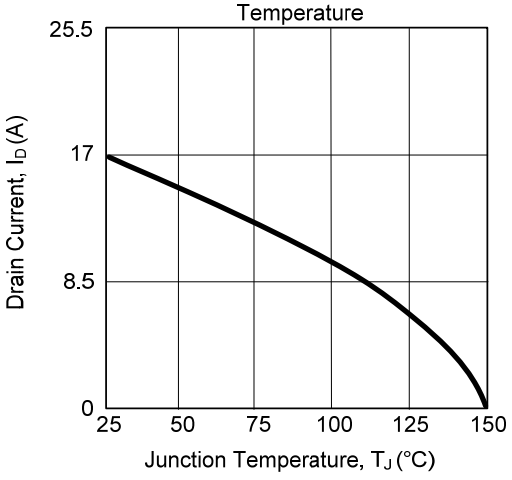
Drain-Source On-Resistance vs. Drain Current



Power Dissipation vs. Junction Temperature



Drain Current vs. Junction Temperature



■ TYPICAL CHARACTERISTICS (Cont.)