



UTT15P06

Power MOSFET

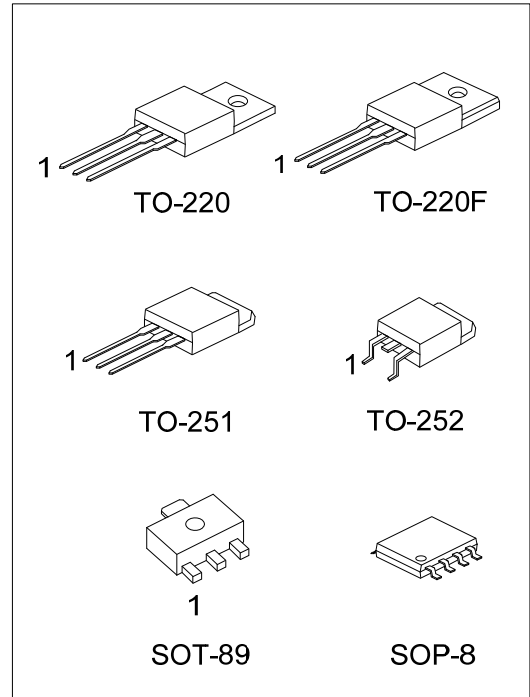
-15A, -60V P-CHANNEL POWER MOSFET

■ DESCRIPTION

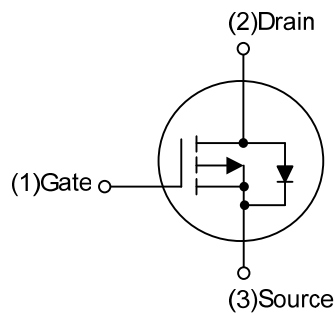
The UTC **UTT15P06** is a P-channel power MOSFET using UTC's advanced technology to provide the customers with high switching speed, cost-effectiveness and minimum on-state resistance. It can also withstand high energy in the avalanche.

■ FEATURES

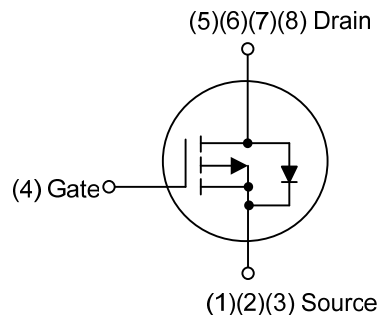
- * $R_{DS(ON)} \leq 75 \text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -15\text{A}$
- $R_{DS(ON)} \leq 120 \text{ m}\Omega$ @ $V_{GS} = -4.5\text{V}$, $I_D = -7.5\text{A}$
- * High Switching Speed



■ SYMBOL



SOT-89/TO-220/TO-220F
TO-251/TO-252

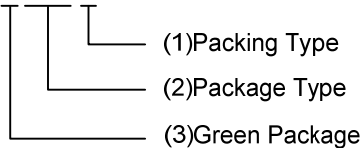


SOP-8

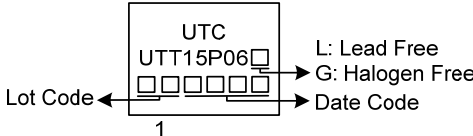
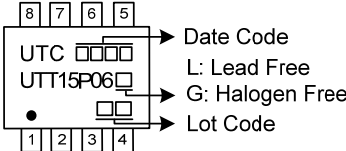
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UTT15P06L-AB3-R	UTT15P06G-AB3-R	SOT-89	G	D	S	-	-	-	-	-	Tube
UTT15P06L-TA3-T	UTT15P06G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UTT15P06L-TF3-T	UTT15P06G-TF3-T	TO-220F	G	D	S	-	-	-	-	-	Tube
UTT15P06L-TM3-T	UTT15P06G-TM3-T	TO-251	G	D	S	-	-	-	-	-	Tube
UTT15P06L-TN3-R	UTT15P06G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UTT15P06L-S08-R	UTT15P06G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

UTT15P06G-AB3-R  (1) Packing Type (2) Package Type (3) Green Package	(1) T: Tube, R: Tape Reel (2) AB3: SOT-89, TA3: TO-220, TF3: TO-220F, TM3: TO-251, TN3: TO-252, S08: SOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

PACKAGE	MARKING
SOT-89	 15P06 → Date Code L: Lead Free G: Halogen Free
TO-220 / TO-220F TO-251 / TO-252	 UTC UTT15P06 → L: Lead Free G: Halogen Free Lot Code → Date Code
SOP-8	 UTC → Date Code UTT15P06 → L: Lead Free G: Halogen Free Lot Code

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	-60	V
Gate-Source Voltage		V _{GSS}	±25	V
Drain Current	Continuous	I _D	-15	A
	Pulsed	I _{DM}	-30	A
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	16.2	mJ
Power Dissipation	SOT-89	P _D	4.3	W
	TO-220		79	W
	TO-220F		37	W
	TO-251/TO-252		39	W
	SOP-8		3	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} = -18A, V_{DD} = -30V, R_G = 25 Ω, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient (Steady state)	SOT-89	θ _{JA}	180	°C/W
	TO-220/TO-220F		62	°C/W
	TO-251/TO-252		110	°C/W
	SOT-8		125	°C/W
Junction to Case	SOT-89	θ _{JC}	29	°C/W
	TO-220		1.58	°C/W
	TO-220F		3.3	°C/W
	TO-251/TO-252		3.2 (Note)	°C/W
	SOT-8		41.67	°C/W

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

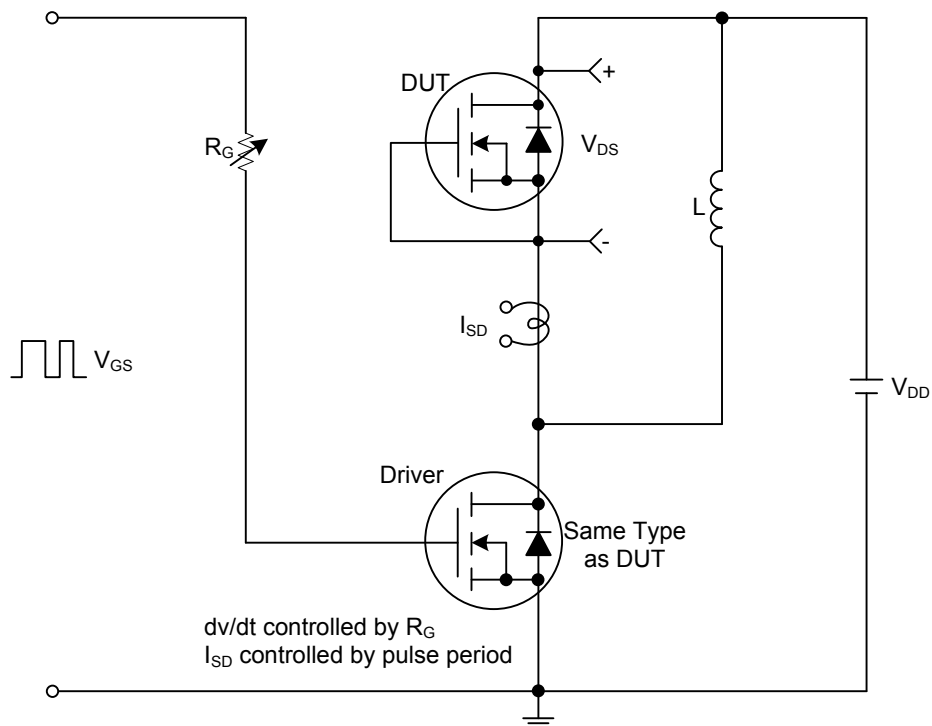
■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	I _D =-250μA, V _{GS} =0V	-60			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =-60V, V _{GS} =0V			-1	μA
Gate-Source Leakage Current	Forward	I _{GSS}	V _{GS} =+25V, V _{DS} =0V			+100	nA
	Reverse		V _{GS} =-25V, V _{DS} =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 =-15A			75	mΩ
			V _{GS} =-4.5V, I _D =-7.5A			120	mΩ
DYNAMIC PARAMETERS (Note 2)							
Input Capacitance		C _{ISS}	V _{GS} =0V, V _{DS} =-25V, f=1.0MHz		1086		pF
Output Capacitance		C _{OSS}			97		pF
Reverse Transfer Capacitance		C _{RSS}			61.6		pF
SWITCHING PARAMETERS							
Total Gate Charge		Q _G	V _{DS} =-30V, V _{GS} =-10V, I _D =-15A I _G =-1mA (Note 1, 2)		22		nC
Gate to Source Charge		Q _{GS}			5		nC
Gate to Drain Charge		Q _{GD}			3		nC
Turn-ON Delay Time		t _{D(ON)}	V _{DD} =-30V, V _{GS} =-10V, I _D =-15A, R _G =3.3Ω (Note 1, 2)		6		ns
Rise Time		t _R			16		ns
Turn-OFF Delay Time		t _{D(OFF)}			30		ns
Fall-Time		t _F			20		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS (T _C =25°C) (Note 2)							
Maximum Body-Diode Continuous Current		I _S				-15	A
Maximum Body-Diode Pulsed Current		I _{SM}				-30	A
Drain-Source Diode Forward Voltage		V _{SD}	I _F =-15A, V _{GS} =0V (Note 1)		-1.0	-1.5	V
Body Diode Reverse Recovery Time		t _{rr}	I _S =-15A, V _{GS} =0V,		40		ns
Body Diode Reverse Recovery Charge		Q _{rr}	dI _F /dt=100A/μs (Note 2)		35		nC

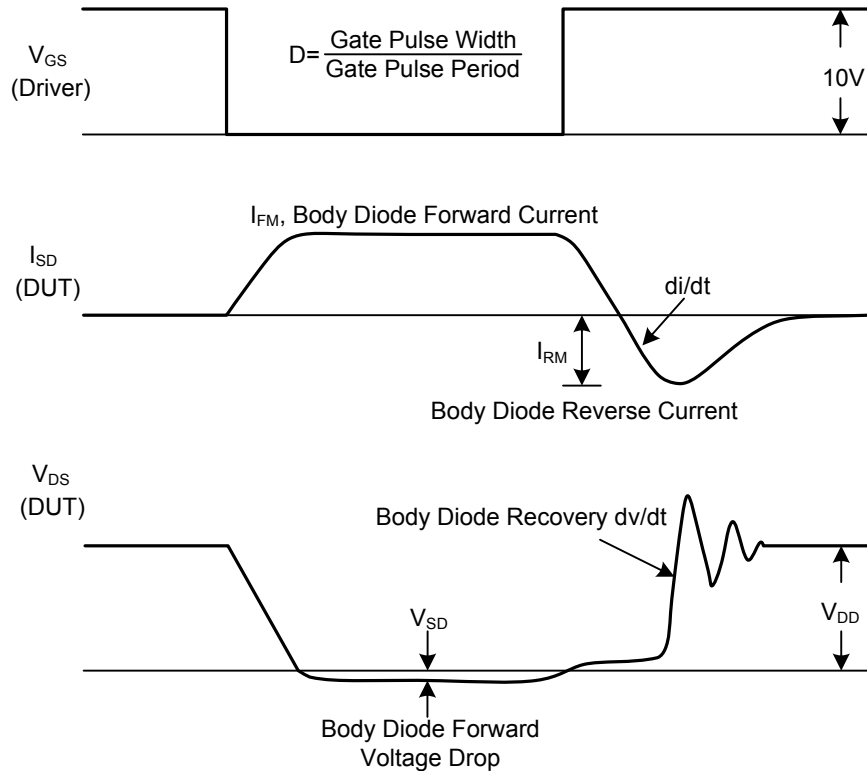
Notes: 1. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS



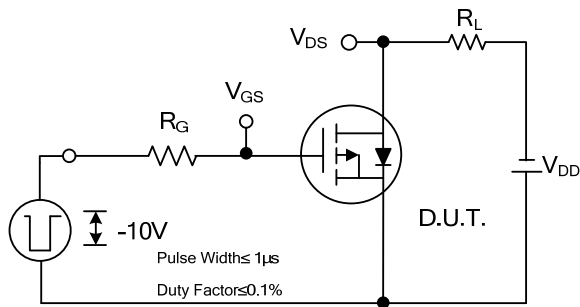
Peak Diode Recovery dv/dt Test Circuit



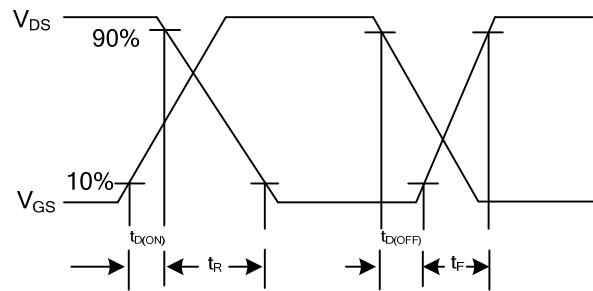
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

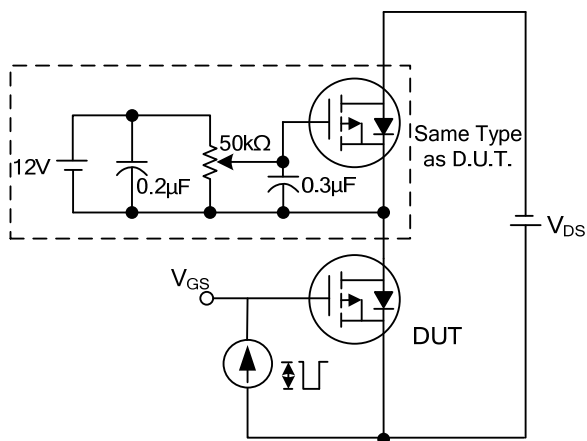
■ TEST CIRCUITS AND WAVEFORMS



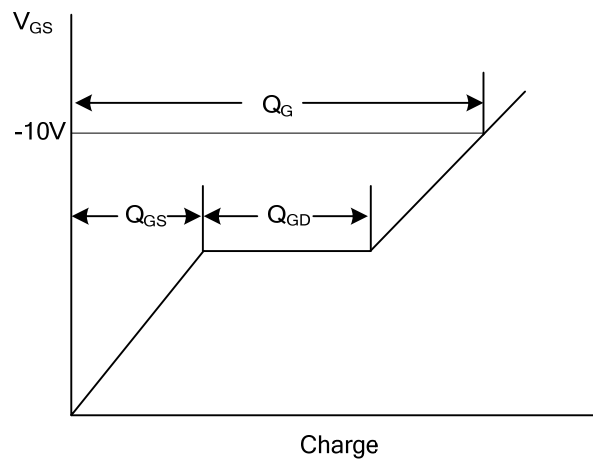
Switching Test Circuit



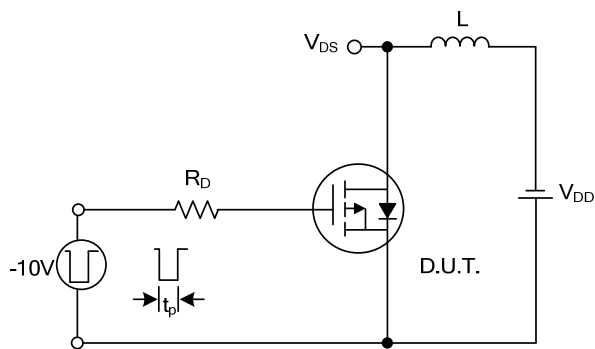
Switching Waveforms



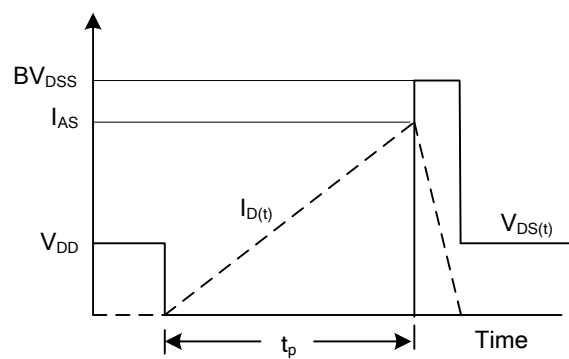
Gate Charge Test Circuit



Gate Charge Waveform

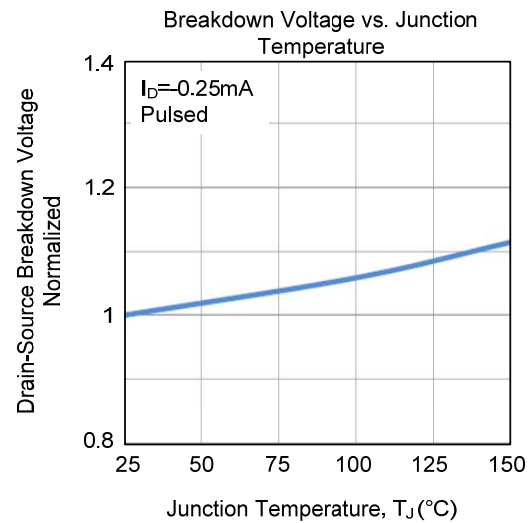
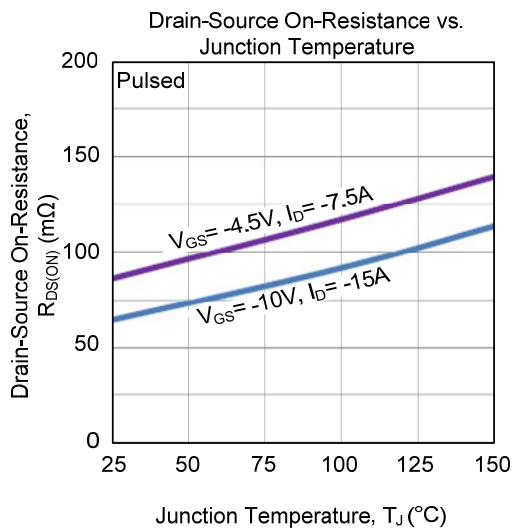
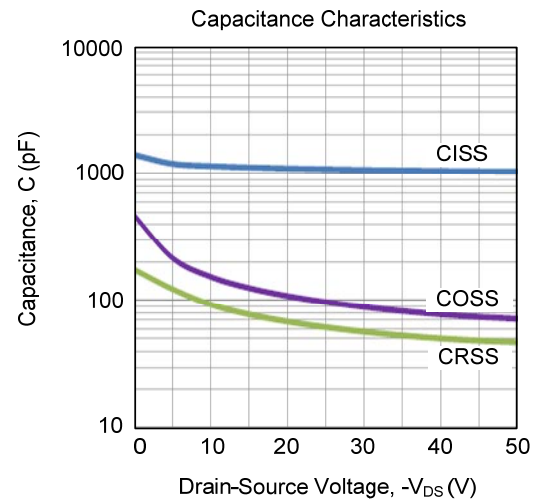
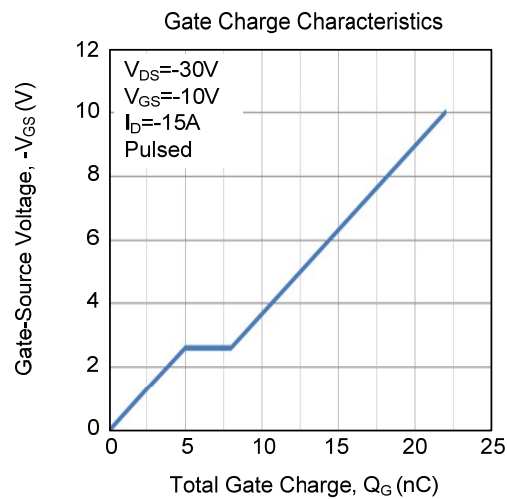
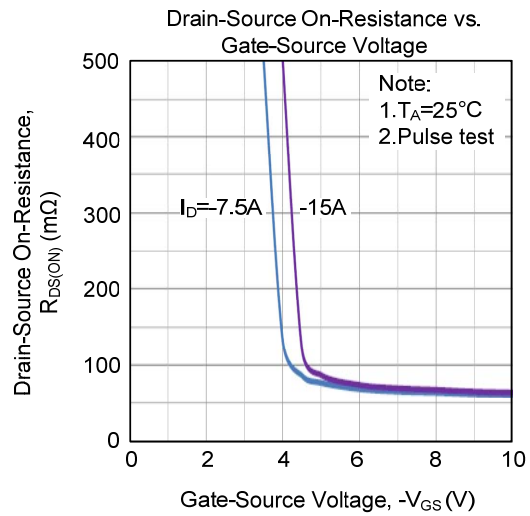
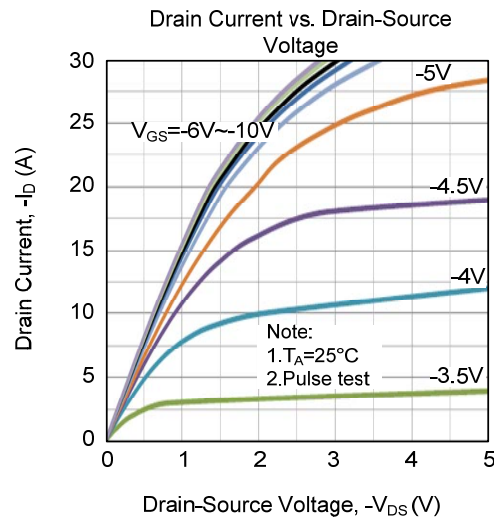


Unclamped Inductive Switching Test Circuit

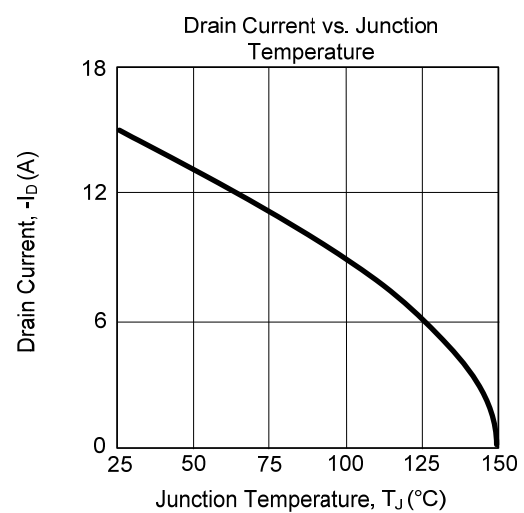
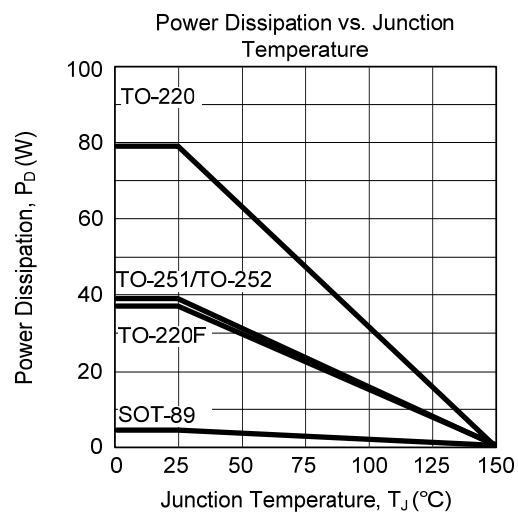
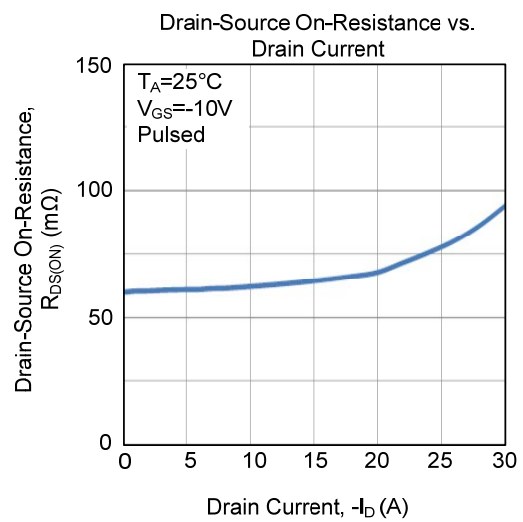
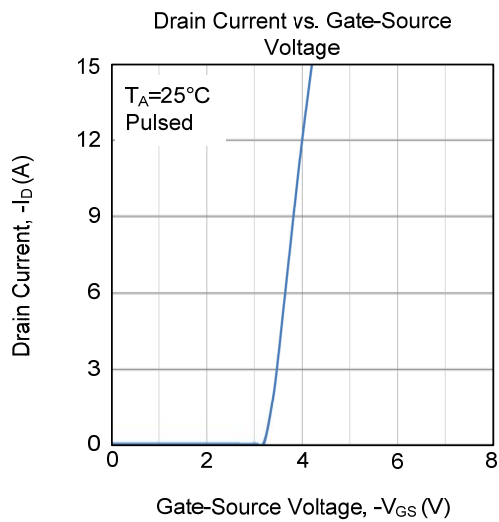
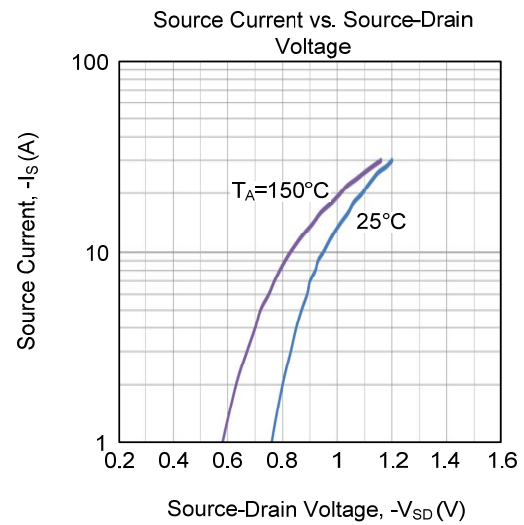
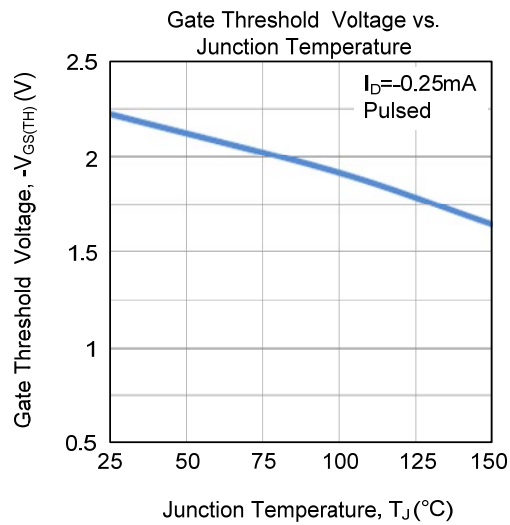


Unclamped Inductive Switching Waveforms

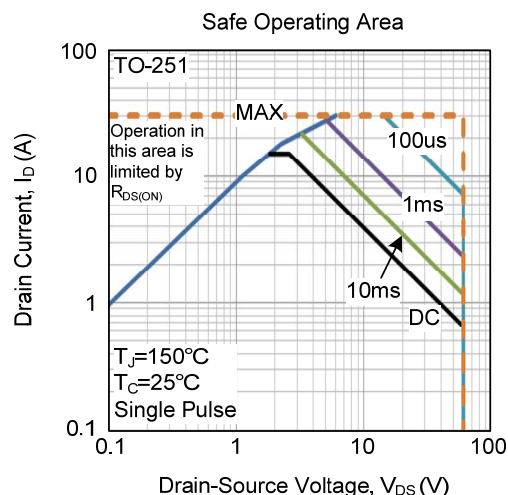
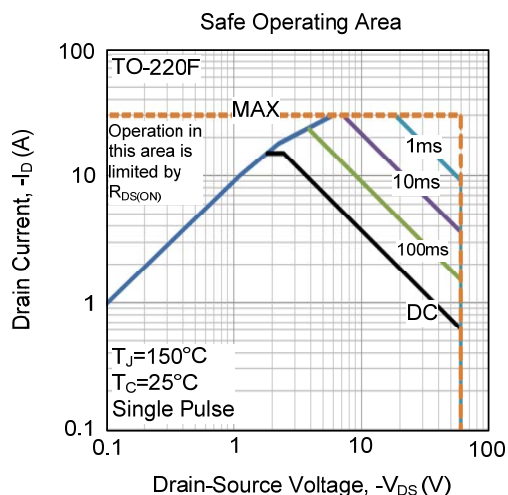
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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