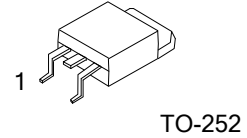


**UT30P04****Power MOSFET****P-CHANNEL ENHANCEMENT
MODE POWER MOSFET****DESCRIPTION**

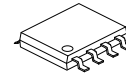
The UTC **UT30P04** is a P-channel enhancement mode Power MOSFET, providing customers fast switching, ruggedized device design, low on-resistance and cost-effectiveness with UTC's advanced technology.

FEATURES

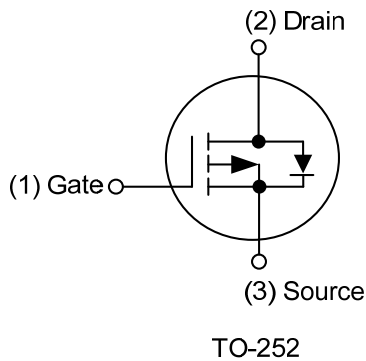
- * $R_{DS(ON)} \leq 36 \text{ m}\Omega$ @ $V_{GS} = -10\text{V}$, $I_D = -15\text{A}$
- * $R_{DS(ON)} \leq 52 \text{ m}\Omega$ @ $V_{GS} = -4.5\text{V}$, $I_D = -15\text{A}$
- * Low on-Resistance
- * Fast Switching Speed



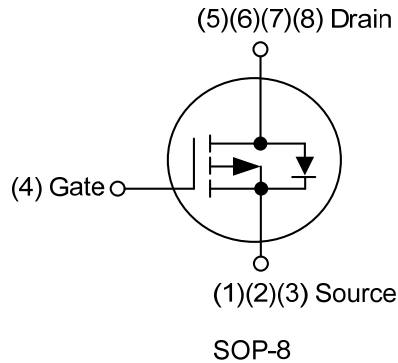
TO-252



SOP-8

SYMBOL

TO-252



SOP-8

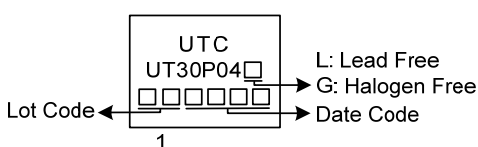
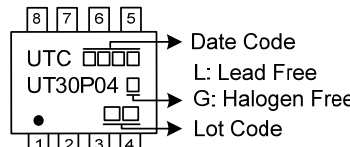
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UT30P04L-TN3-R	UT30P04G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
UT30P04L-S08-R	UT30P04G-S08-R	SOP-8	S	S	S	G	D	D	D	D	Tape Reel

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

UT30P04G-TN3-R		(1) Packing Type	(1) R: Tape Reel
		(2) Package Type	(2) TN3: TO-252, S08: SOP-8
		(3) Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

TO-252	SOP-8
 Diagram of TO-252 marking: The package is marked with 'UTC' and 'UT30P04' followed by a small square. Below this, there are four small squares. An arrow labeled 'Lot Code' points to the first square. An arrow labeled 'Date Code' points to the last square. To the right of the package, there are three labels: 'L: Lead Free', 'G: Halogen Free', and 'Date Code'.	 Diagram of SOP-8 marking: The package is marked with 'UTC' and 'UT30P04' followed by a small square. Below this, there are four small squares. An arrow labeled 'Date Code' points to the first square. An arrow labeled 'Lot Code' points to the last square. To the right of the package, there are three labels: 'L: Lead Free', 'G: Halogen Free', and 'Lot Code'.

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

PARAMETER			SYMBOL	RATINGS	UNIT
Drain-Source Voltage			V _{DS}	-40	V
Gate-Source Voltage			V _{GS}	±20	V
Continuous Drain Current (T _C =25°C)			I _D	-30	A
Pulsed Drain Current (Note 2)			I _{DM}	-60	A
Avalanche Energy (Note 3)			E _{AS}	39	mJ
Peak Diode Recovery dv/dt (Note 4)			dv/dt	1.1	V/nS
Power Dissipation	T _C =25°C	TO-252	P _D	50	W
		SOP-8		1.9	W
Operating Junction Temperature			T _J	-55 ~ +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} = -27.9A, V_{DD} = -20V, R_G = 25Ω, Starting T_J = 25°C

4. I_{SD} ≤ -30A, di/dt ≤ 200A/μs, V_{DD} ≤ BV_{DSS}, Starting T_J = 25°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-252	θ _{JA}	110	°C/W
	SOP-8		90 (Note)	°C/W
Junction to Case	TO-252	θ _{JC}	2.5 (Note)	°C/W
	SOP-8		65.7 (Note)	°C/W

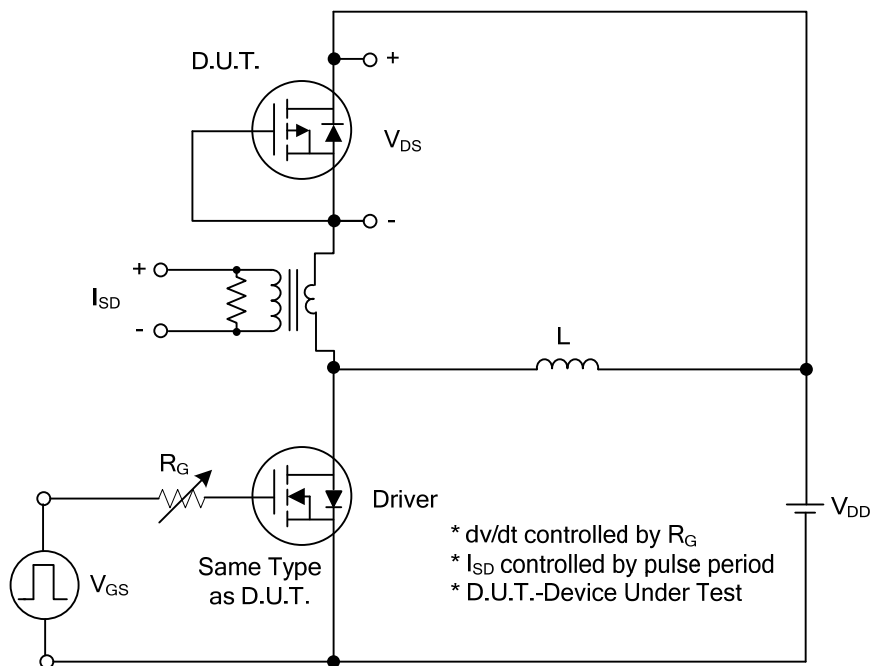
Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

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

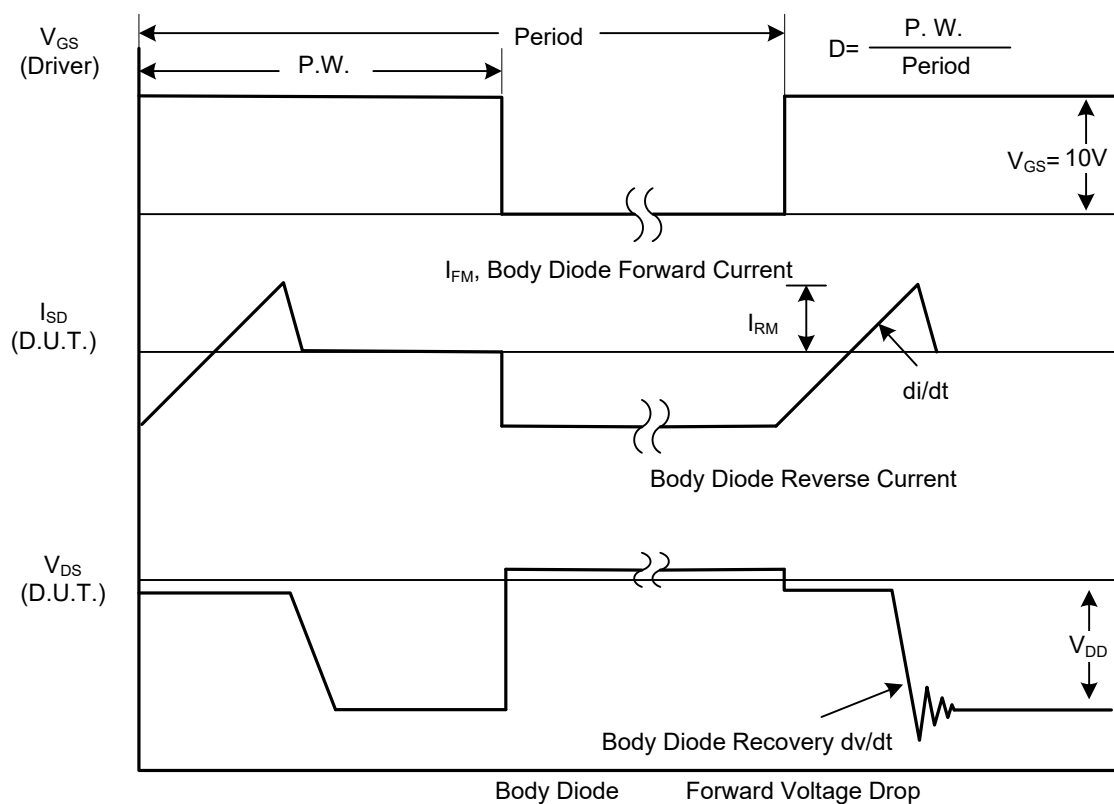
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =-250μA, V _{GS} =0V	-40			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =-40V, V _{GS} =0V			-1	μA
Gate- Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±250	nA
ON 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 (Note 1)	R _{DS(ON)}	V _{GS} =-10V, I _D =-15A			36	mΩ
		V _{GS} =-4.5V, I _D =-15A			52	mΩ
DYNAMIC PARAMETERS						
Input Capacitance	C _{ISS}	V _{GS} =0V, V _{DS} =-20V, f=1.0MHz		1107		pF
Output Capacitance	C _{OSS}			158		pF
Reverse Transfer Capacitance	C _{RSS}			134.9		pF
GATE CHARGE (Note 2)						
Total Gate Charge	Q _G	V _{DS} =-32V, V _{GS} =-10V, I _D =-30A , I _G =-1mA (Note 1, 2)		30		nC
Gate to Source Charge	Q _{GS}			3.5		nC
Gate to Drain Charge	Q _{GD}			10.9		nC
SWITCHING PARAMETERS (Note 2)						
Turn-ON Delay Time	t _{D(ON)}	V _{DS} =-15V, V _{GS} =-10V, I _D =-30A, R _{GS} =6.0Ω (Note 1, 2)		7		ns
Rise Time	t _R			16.3		ns
Turn-OFF Delay Time	t _{D(OFF)}			42.4		ns
Fall-Time	t _F			27		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I _S				-30	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}				-60	A
Drain-Source Diode Forward Voltage	V _{SD}	I _F =-10A, V _{GS} =0V			-1.2	V
Reverse Recovery Time	t _{rr}	I _F =-30A, dI _F /dt=100A/μs		70		ns
Reverse Recovery Charge	Q _{rr}			212.6		nC

Notes: 1. Repetitive Rating: Pulse width $\leq 300\mu\text{sec}$, duty cycle $\leq 2\%$.
2. Independent of operating temperature.

■ TEST CIRCUITS AND WAVEFORMS

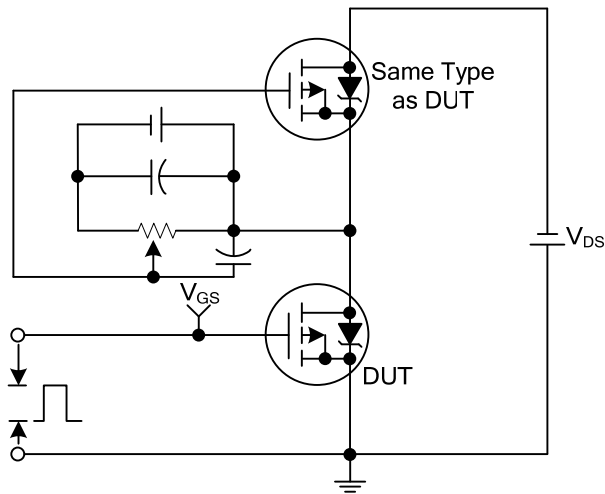


Peak Diode Recovery dv/dt Test Circuit

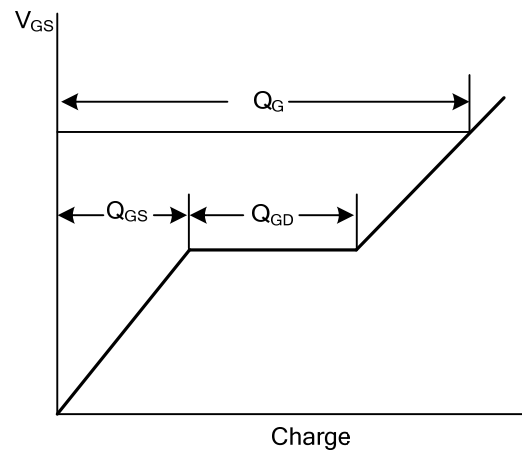


Peak Diode Recovery dv/dt Waveforms

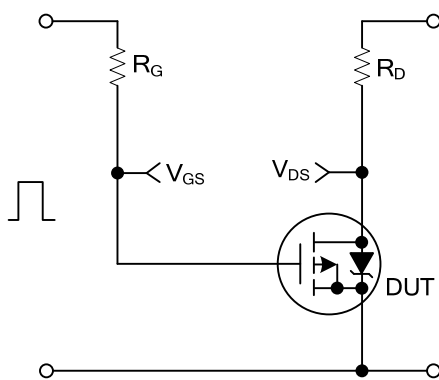
■ TEST CIRCUITS AND WAVEFORMS



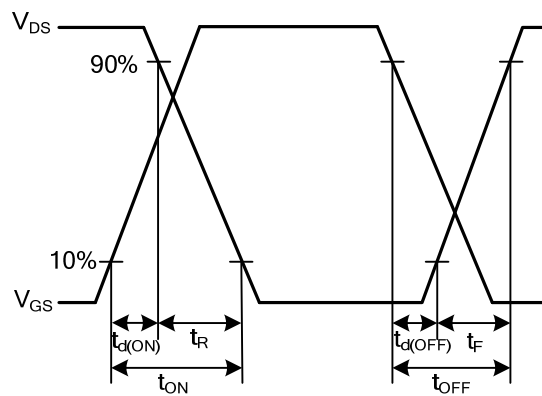
Gate Charge Test Circuit



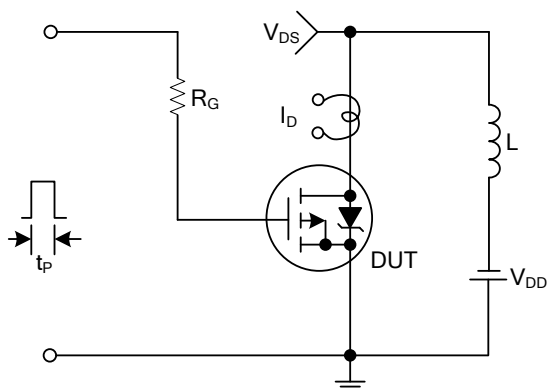
Gate Charge Waveforms



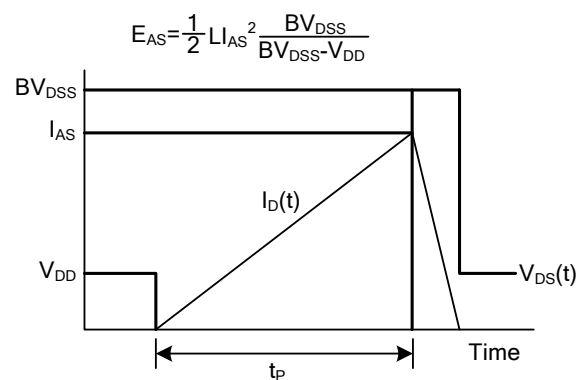
Resistive Switching Test Circuit



Resistive Switching Waveforms

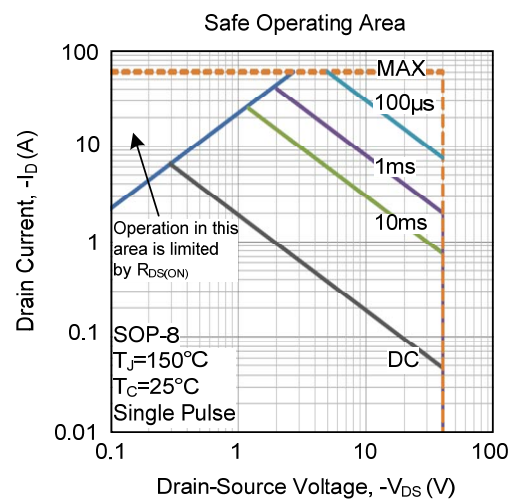
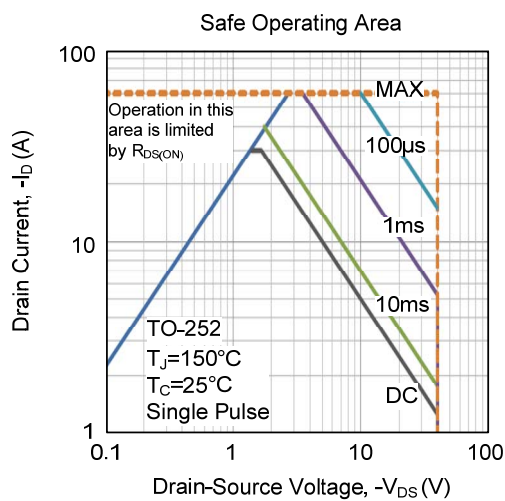
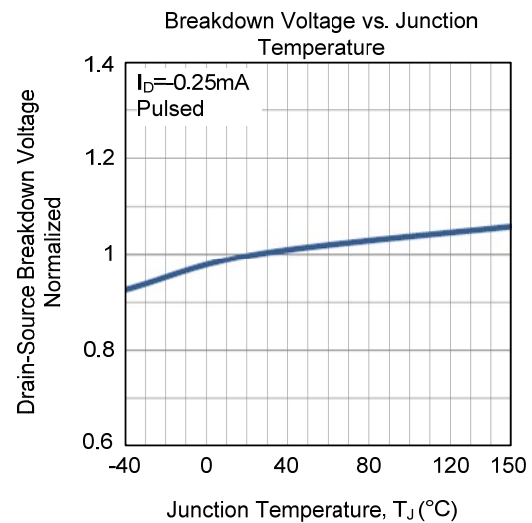
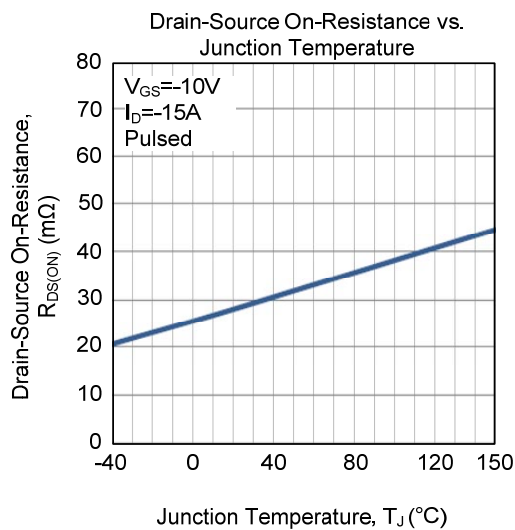
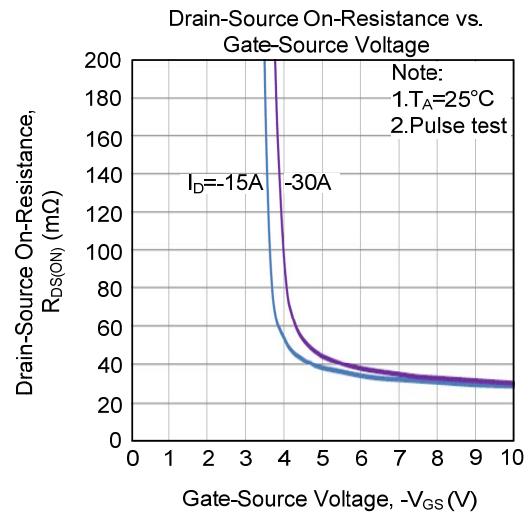
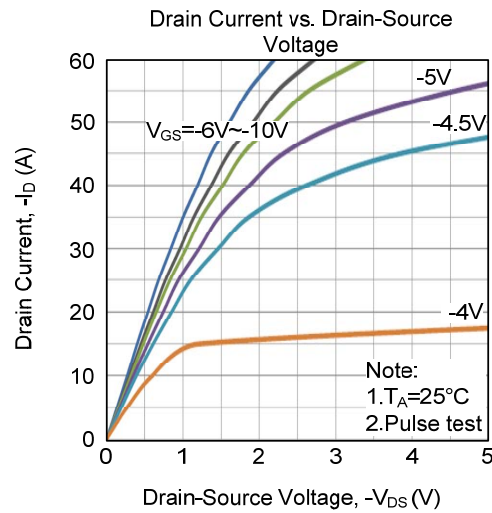


Unclamped Inductive Switching Test Circuit

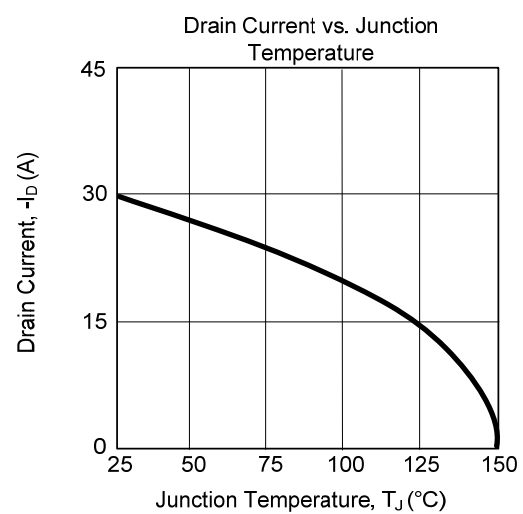
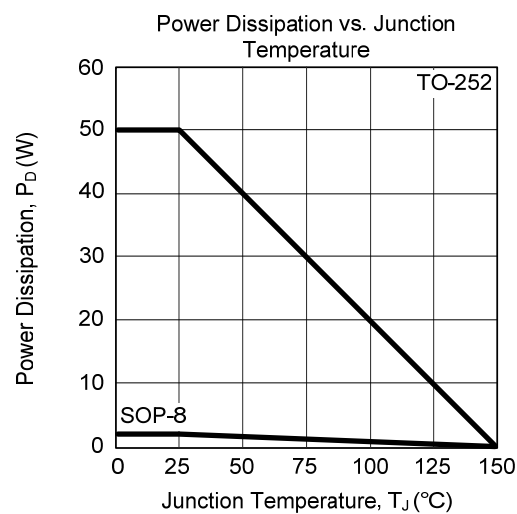
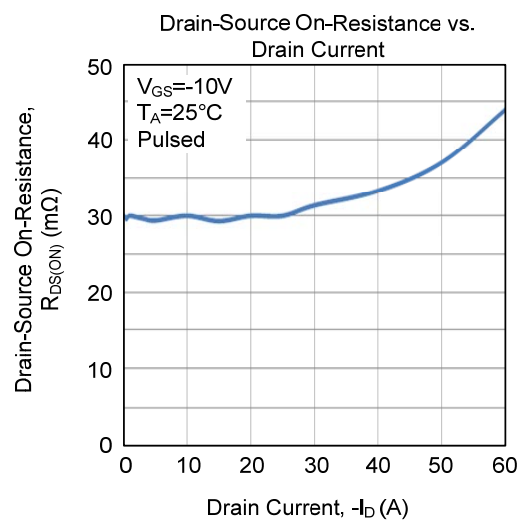
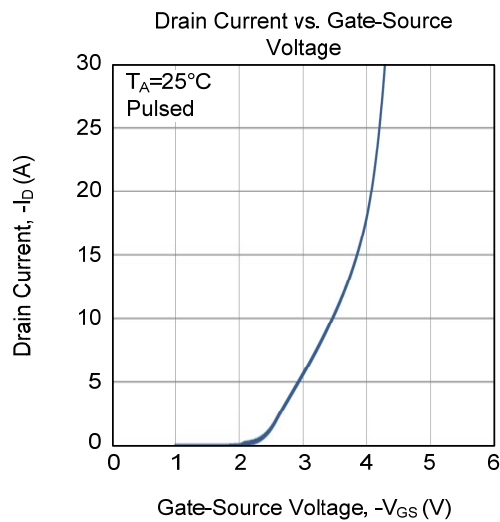
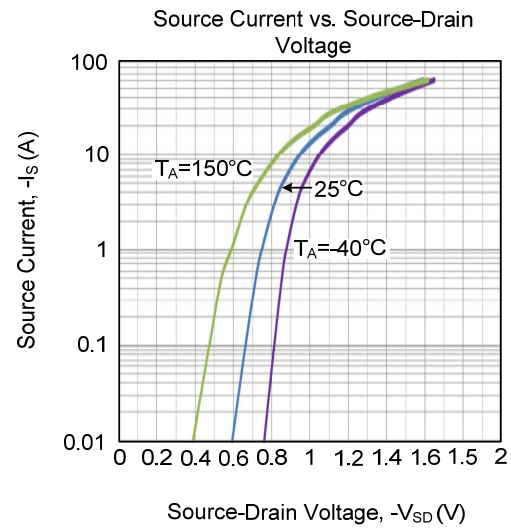
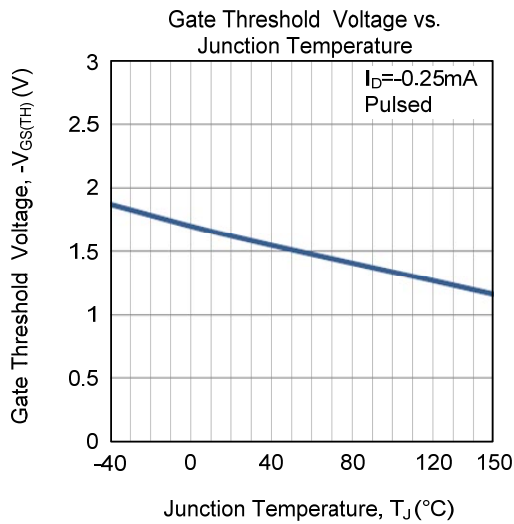


Unclamped Inductive Switching Waveforms

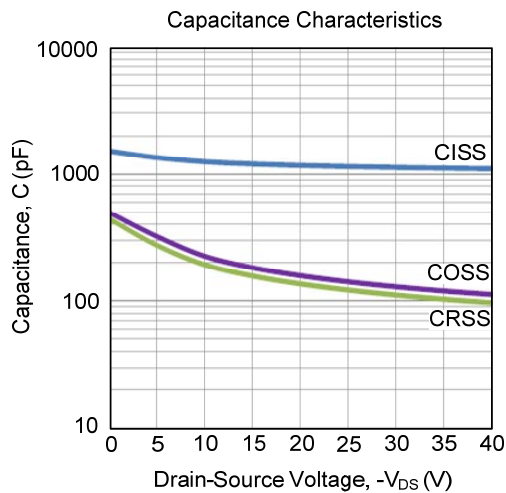
TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS (Cont.)



■ TYPICAL CHARACTERISTICS (Cont.)



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