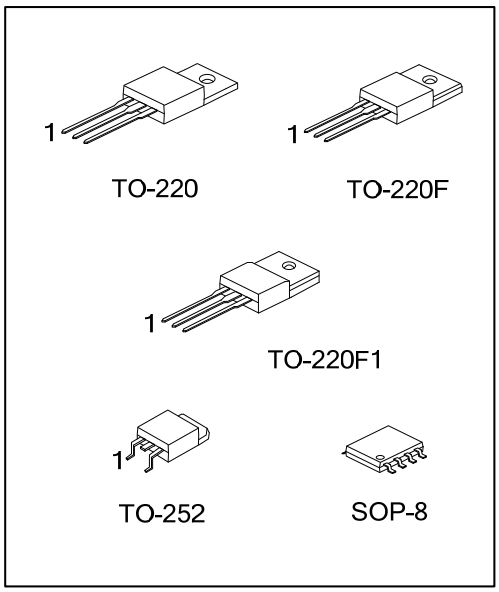
UF634

Power MOSFET

ADVANCED POWER MOSFET



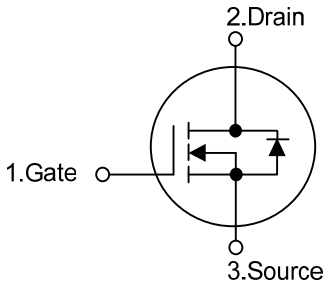
■ DESCRIPTION

The UTC **UF634** is a N-channel Power MOSFET and it uses UTC advanced technology to provide customers with lower $R_{DS(ON)}$, improved gate charge and so on.

■ FEATURES

* $R_{DS(ON)}$<0.45Ω @ V_{GS}=10V, I_D=8.1A
* Lower Input Capacitance
* Improved Gate Charge
* Lower Leakage Current: 10μA (MAX.) @ V_{DS} = 250V
* Avalanche Rugged Technology
* Rugged Gate Oxide Technology
* Extended Safe Operating Area

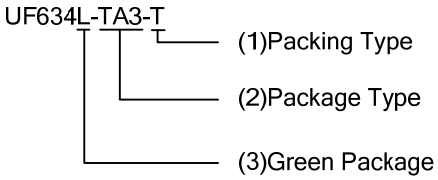
■ SYMBOL



■ ORDERING INFORMATION

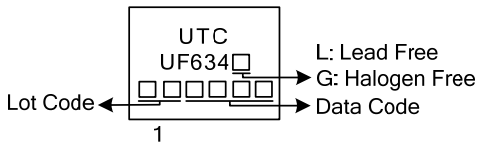
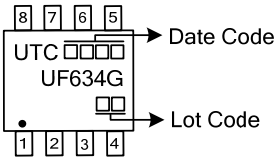
Ordering Number		Package	Pin Assignment								Packing
Lead Free	Halogen Free		1	2	3	4	5	6	7	8	
UF634L-TA3-T	UF634G-TA3-T	TO-220	G	D	S	-	-	-	-	-	Tube
UF634L-TF1-T	UF634G-TF1-T	TO-220F1	G	D	S	-	-	-	-	-	Tube
UF634L-TF3-T	UF634G-TF3-T	TO-220F	G	D	S	-	-	-	-	-	Tube
UF634L-TN3-R	UF634G-TN3-R	TO-252	G	D	S	-	-	-	-	-	Tape Reel
-	UF634G-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, TF3:TO-220F
TN3: TO-252, S08: SOP-8
(3) L: Lead Free, G: Halogen Free and Lead Free

■ MARKING

TO-220 / TO-220F / TO-220F1 TO-220F2 / TO-252 / TO-262	SOP-8
	

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

PARAMETER		SYMBOL	RATINGS	UNIT
Gate-to-Source Voltage		V_{GS}	± 30	V
Drain-to-Source Voltage		V_{DSS}	250	V
Continuous Drain Current	T_C=25°C	I_D	8.1	A
Drain Current-Pulsed (Note 2)		I_{DM}	32.4	A
Avalanche Current (Note 2)		I_{AR}	8.1	A
Single Pulsed Avalanche Energy (Note 3)		E_{AS}	205	mJ
Repetitive Avalanche Energy (Note 2)		E_{AR}	7.4	mJ
Power Dissipation	TO-220	P_D	74	W
	TO-220F/TO-220F1		38	W
	TO-252		50	W
	SOP-8		5	W
Operating Junction Temperature		T_J	+150	°C
Storage Temperature		T_{STG}	-55~+150	°C

Note: 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=6.24mH, I_{AS}=8.1A, V_{DD}=50V, R_G=27 Ω, Starting T_J=25°C

■ THERMAL RESISTANCE

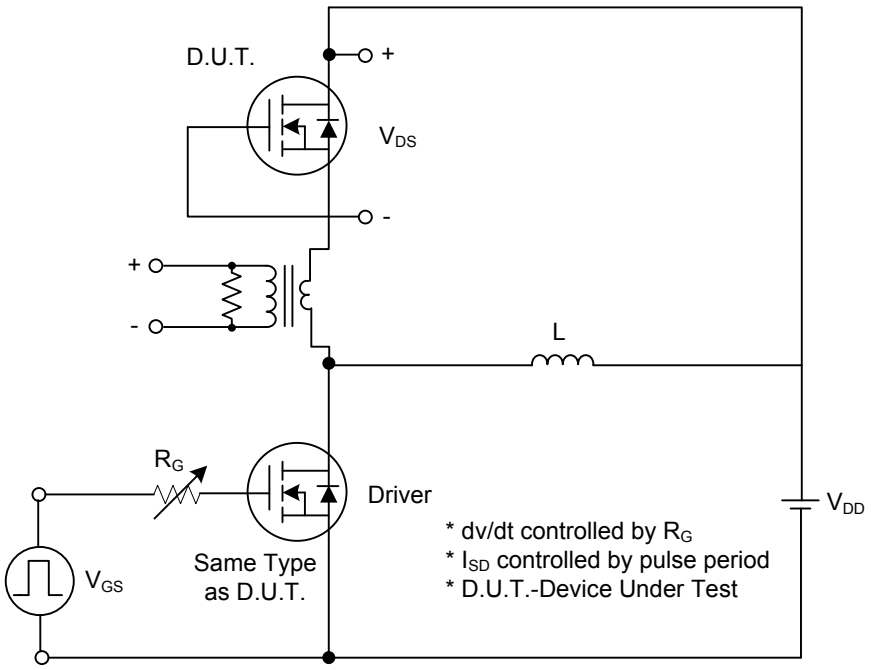
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F1 TO-220F	θ_{JA}	62.5	°C/W
	TO-252		110	°C/W
	SOP-8		83	°C/W
Junction to Case	TO-220	θ_{JC}	1.69	°C/W
	TO-220F/TO-220F1		3.29	°C/W
	TO-252		2.5	°C/W
	SOP-8		24	°C/W

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

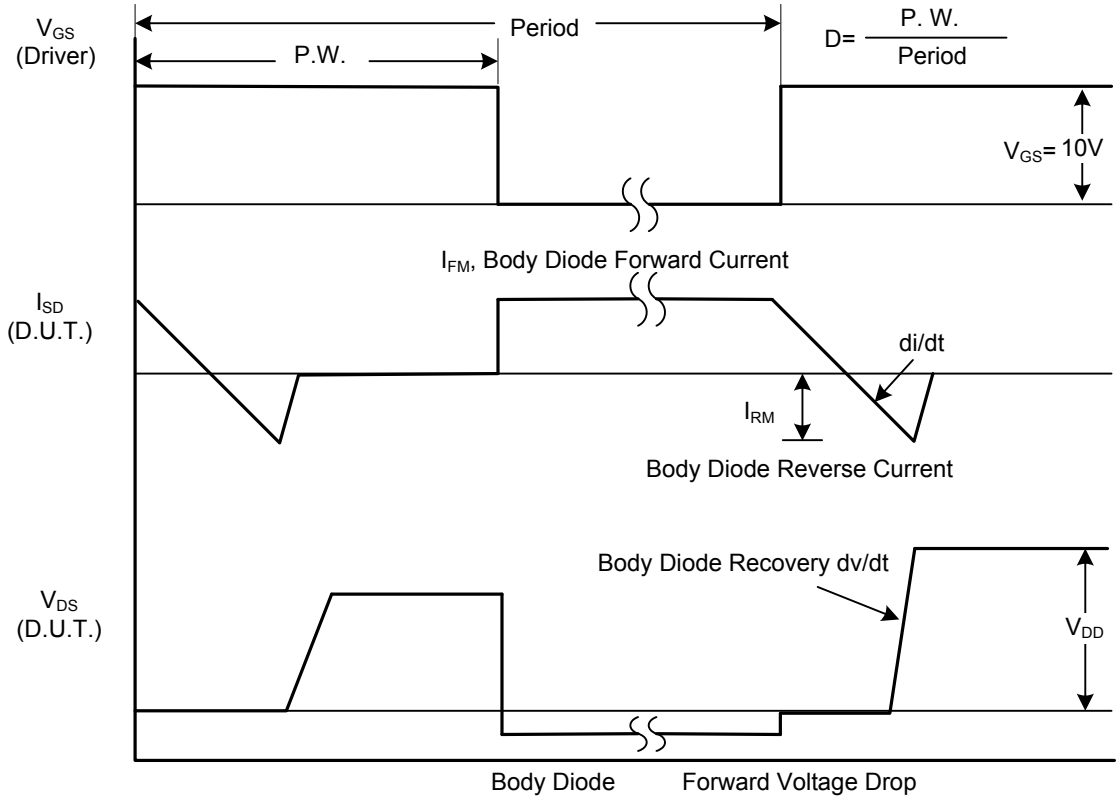
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	250			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=250V			10	μA
Gate- Source Leakage Current	I_{GSS}	V_{GS}=±30V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}= V_{GS}, I_D=250μA	2.0		4.0	V
Static Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=8.1A			0.45	Ω
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		730	950	pF
Output Capacitance	C_{OSS}			110	130	pF
Reverse Transfer Capacitance	C_{RSS}			50	60	pF
SWITCHING PARAMETERS						
Total Gate Charge	Q_G	V_{GS}=10V, V_{DS}=200V, I_D=8.1A (Note 1, 2)		30	40	nC
Gate to Source Charge	Q_{GS}			5.8		nC
Gate to Drain Charge	Q_{GD}			13.5		nC
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD}=125V, I_D=8.1A, R_G=12Ω (Note 1, 2)		13	40	ns
Rise Time	t_R			14	40	ns
Turn-OFF Delay Time	$t_{D(OFF)}$			53	120	ns
Fall-Time	t_F			21	50	ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage (Note 2)	V_{SD}	I_S=8.1A, V_{GS}=0V, T_J=25°C			1.5	V
Maximum Body-Diode Continuous Current	I_S				8.1	A
Pulsed-Source Current (Note 1)	I_{SM}				32.4	A

Note: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. Pulse Test: Pulse Width = 250μs, Duty Cycle ≤2%.
3. Essentially Independent of Operating Temperature.

■ TEST CIRCUITS AND WAVEFORMS

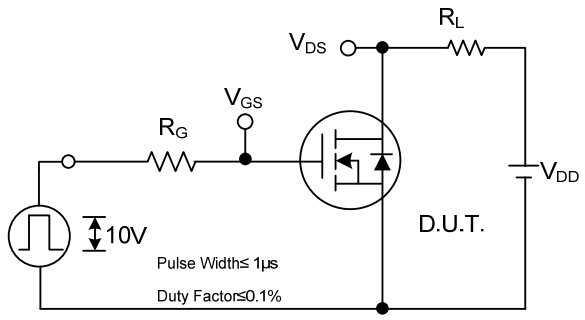


Peak Diode Recovery dv/dt Test Circuit

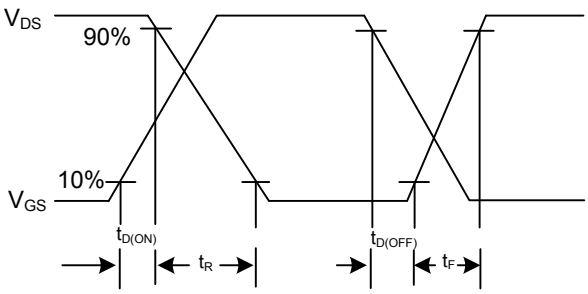


Peak Diode Recovery dv/dt Waveforms

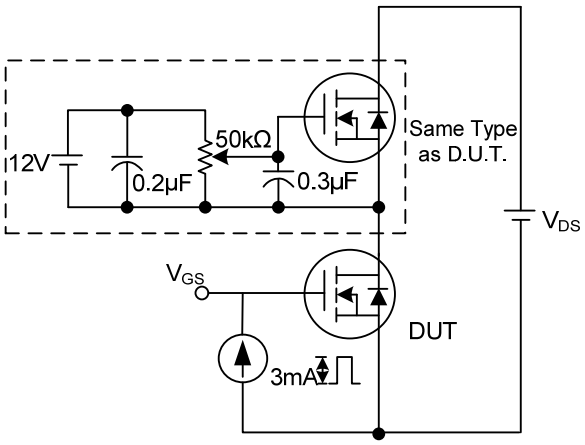
■ TEST CIRCUITS AND WAVEFORMS (Cont.)



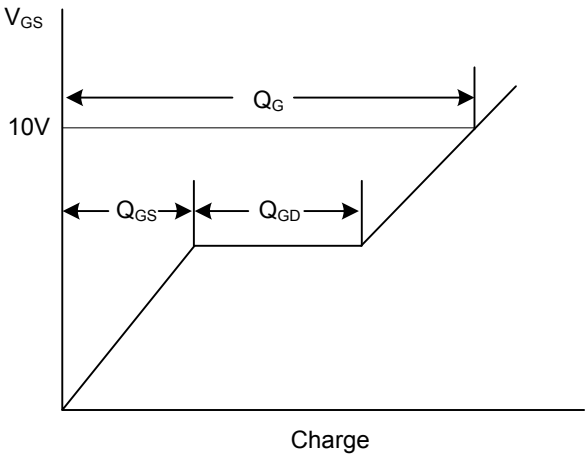
Switching Test Circuit



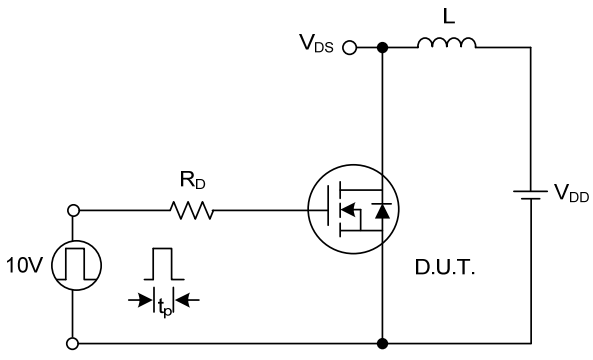
Switching Waveforms



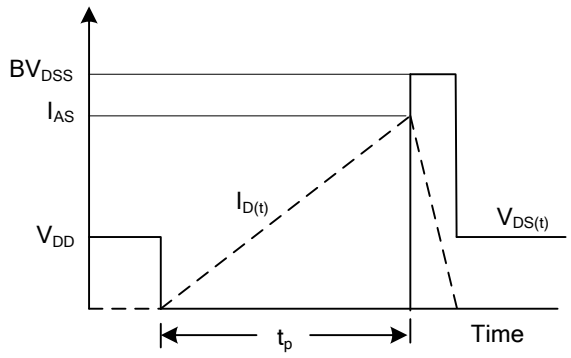
Gate Charge Test Circuit



Gate Charge Waveform



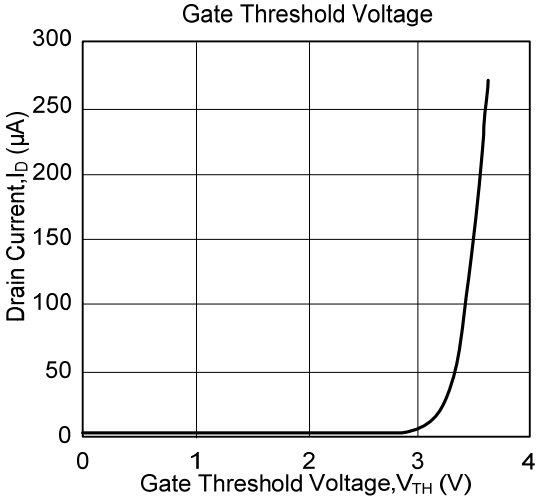
Unclamped Inductive Switching Test Circuit



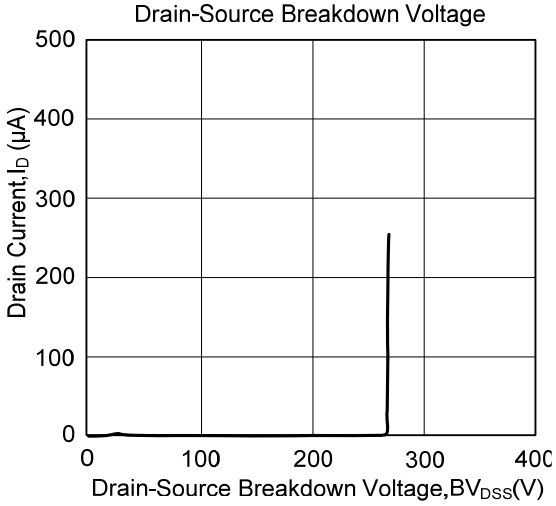
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

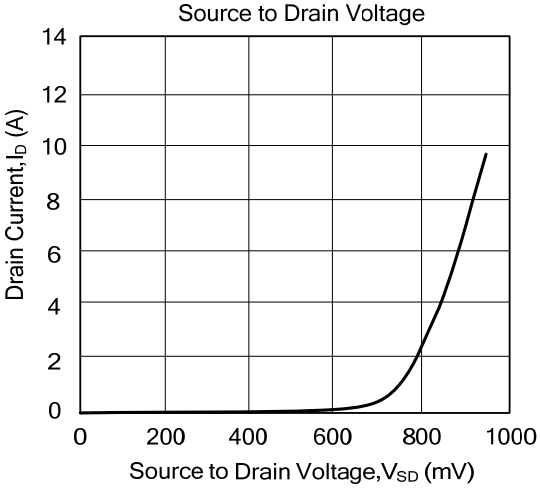
Drain Current vs.
Gate Threshold Voltage



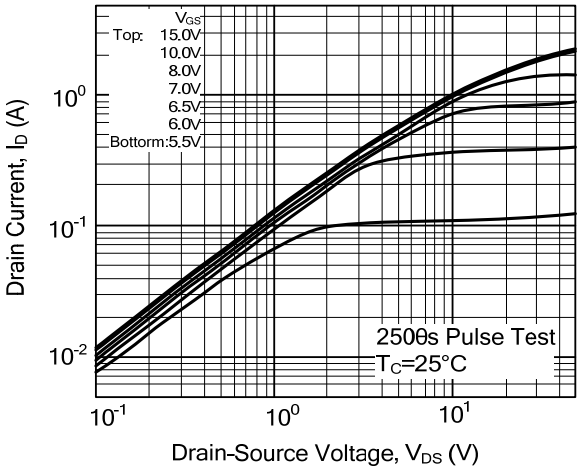
Drain Current vs.
Drain-Source Breakdown Voltage



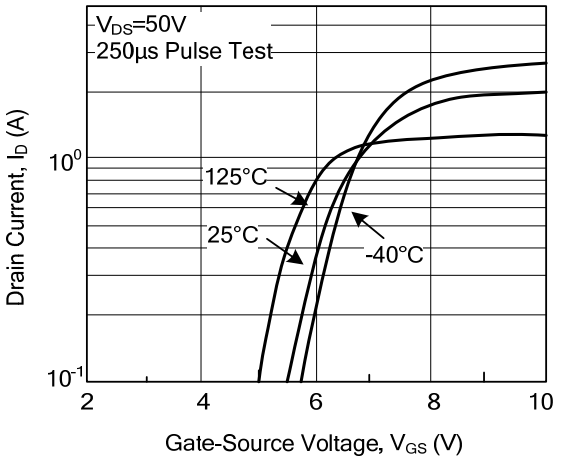
Drain Current vs.
Source to Drain Voltage



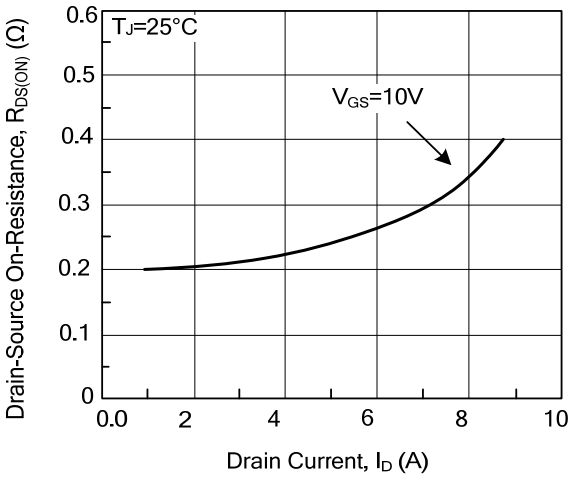
Output Characteristics



Transfer Characteristics

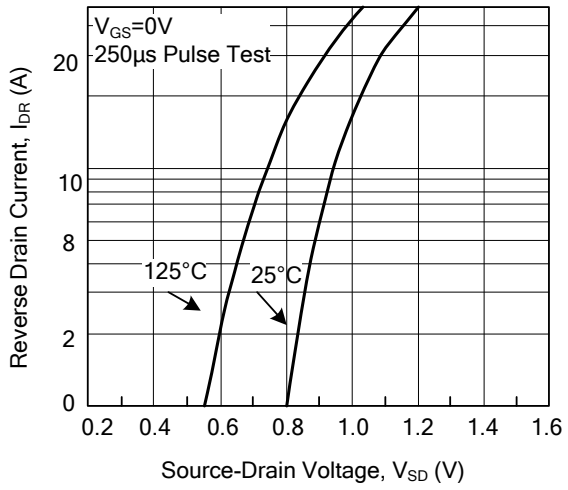


On-Resistance vs. Drain Current

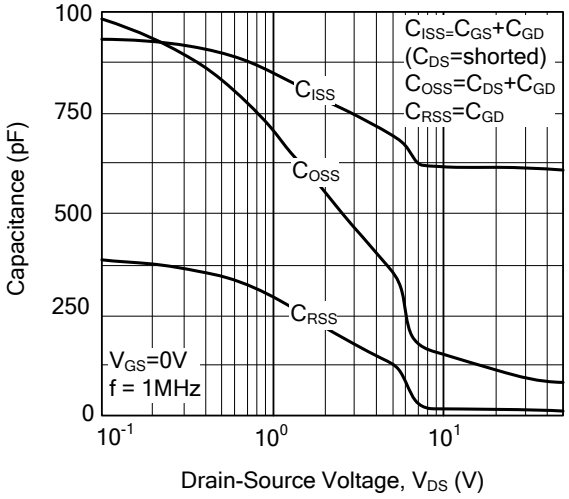


■ TYPICAL CHARACTERISTICS(Cont.)

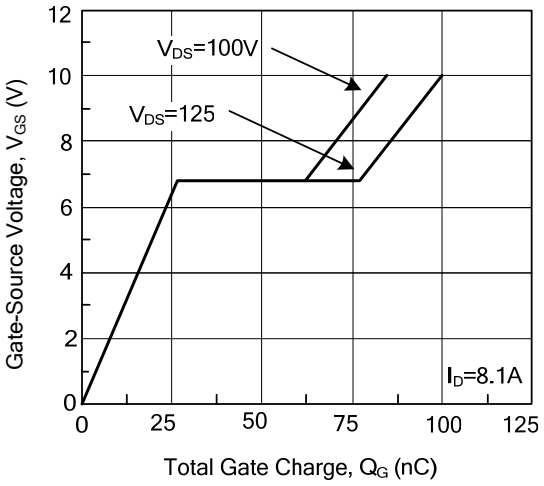
Source- Drain Diode Forward Voltage



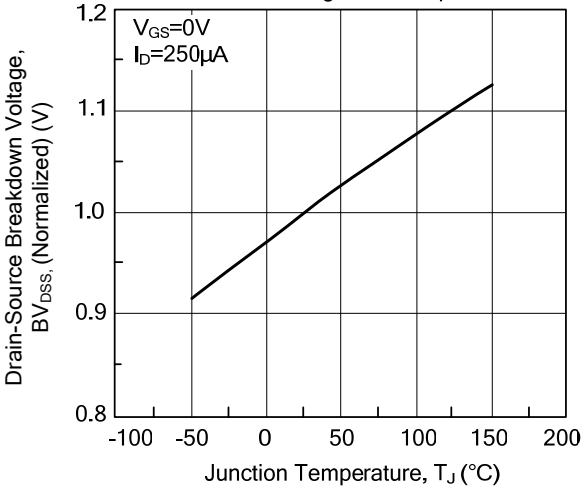
Capacitance vs. Drain-Source Voltage



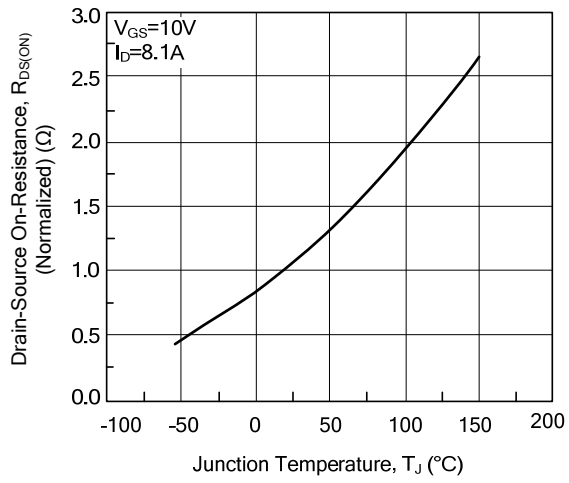
Gate Charge vs. Gate-Source Voltage



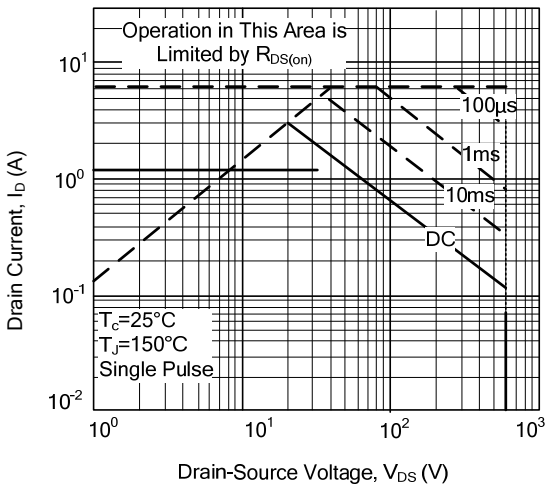
Breakdown Voltage vs. Temperature



On-Resistance vs. Temperature

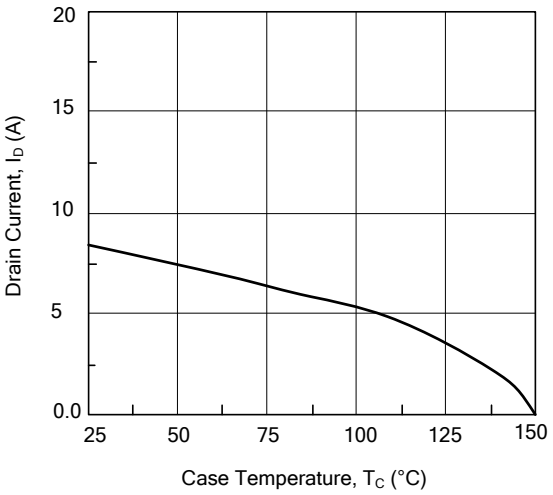


Max. Safe Operating Area



■ TYPICAL CHARACTERISTICS(Cont.)

Max. Drain Current vs. Case Temperature



Thermal Response