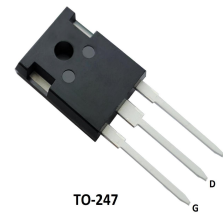


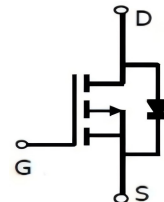
Features

- $V_{DS}=-400V$, $I_D=-38A$
 $R_{DS(on)} \leq 210m\Omega$ @ $V_{GS}=-10V$
- High density cell design for low $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation



Applications

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply



Absolute Ratings ($T_C=25^\circ C$, unless otherwise specified)

Parameter	Symbol		Limit	Unit
Drain-Source Voltage	V _{DSS}		-400	V
Gate-Source Voltage	V _{GSS}		±30	V
Gate-Source Voltage	V _{GSS}		±20	V
Drain Current-continuous	I _D	T _C =25°C	-38	A
		T _C = 100°C	-24	A
Drain Current-pulse (note 1)	I _{DM}		-114	A
Single Pulsed Avalanche Energy (note 2)	E _{AS}		3120	mJ
Maximum Power Dissipation	P _D	T _C =25°C	416	W
		T _C = 100°C	205	W
Operating and Storage Temperature Range	T _J , T _{STG}		-55~+150	°C
Maximum Lead Temperature for Soldering	T _L		300	°C

Electrical Characteristics ($T_{CASE}=25^\circ C$ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off-Characteristics						
Drain-Source Voltage	BV_{DSS}	$I_D=-250\mu A, V_{GS}=0V$	-400	-	-	V

Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-200V, V_{GS}=0V$	-	-	-10	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}= \pm 20V, V_{DS}=0V$	-	-	± 100	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-2.5	-3.2	-4.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=-15V, I_D=-1A$ (note 3)	-	210	300	m Ω
Forward Transconductance	g_{fs}	$V_{DS}=-10V, I_D=-19A$ (note 3)	20	30	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{DS}=-25V, V_{GS}=0V,$ $f=1.0MHz$ (note 4)	-	4995	-	pF
Output capacitance	C_{oss}		-	515	-	pF
Reverse transfer capacitance	C_{rss}		-	74	-	pF
Switching-Characteristics						
Turn-On delay time	$t_{d(on)}$	$V_{DS}=-200V, I_D=-19A,$ $R_G=3\Omega, V_{GS}=-10V$	-	23	-	ns
Turn-On rise time	t_r		-	31	-	ns
Turn-Off delay time	$t_{d(Off)}$		-	75	-	ns
Turn-Off rise time	t_f		-	33	-	ns
Total Gate Charge	Q_g	$V_{DS}=-200V, I_D=-19A,$ $V_{GS}=-10V$ (note 4)	-	98	-	nC
Gate-Source charge	Q_{gs}		-	28	-	nC
Gate-Drain charge	Q_{gd}		-	37	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-1A$ (note3)	-	-	-1.1	V
Diode Forward Current	I_S		-	-	-38	A
Repetitive surge Drain-Source Diode Forward Current (note 1)	I_{SM}		-	-	-152	A
Reverse recovery time	t_{rr}	$V_{GS}=0V, I_S=-19A$ $-dI_F/dt=-150A/\mu s$	-	475	-	ns
Reverse recovery charge	Q_{rr}	$V_R=100V$	-	8.05	-	μC

Thermal Characteristic

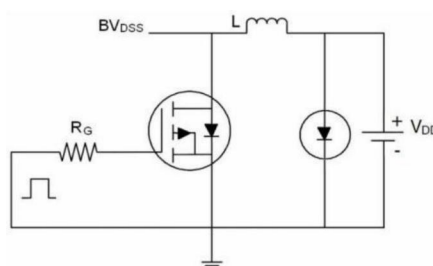
Parameter	Symbol	Value	Unit
Thermal Resistance, junction to Case	$R_{th(j-c)}$	0.25	$^{\circ}C/W$
Thermal Resistance, junction to Ambient	$R_{th(j-a)}$	42	$^{\circ}C/W$

Notes:

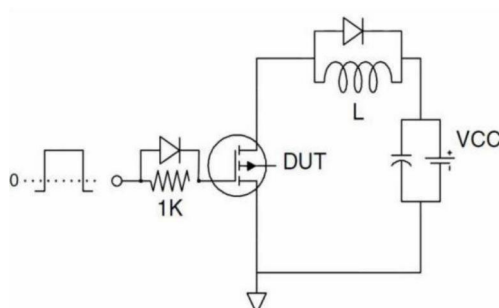
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. EAS condition: $T_j=25^{\circ}C$, $V_{DD}=-30V$, $V = -10V$, $L=0.5mH$, $R_g=25\Omega$
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

Test Circuit

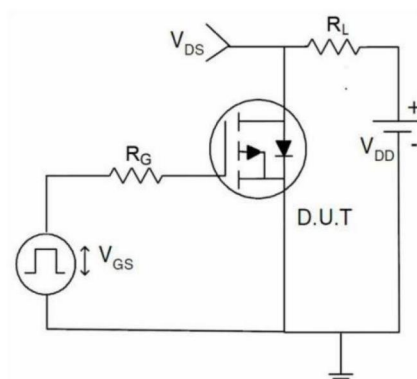
(1) EAS Test Circuit



(2) Gate Charge Test Circuit

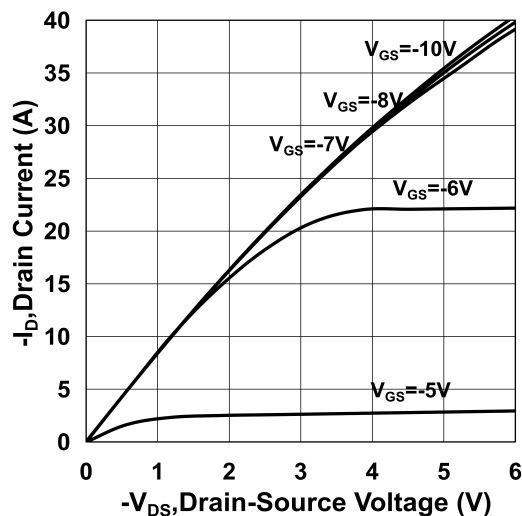


(3) Switch Time Test Circuit

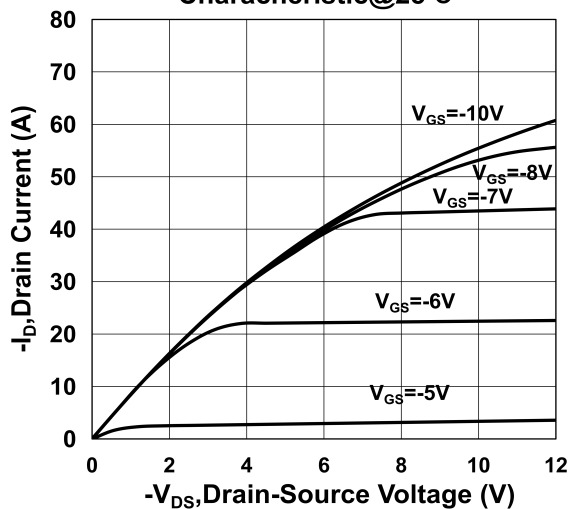


Electrical Characteristics

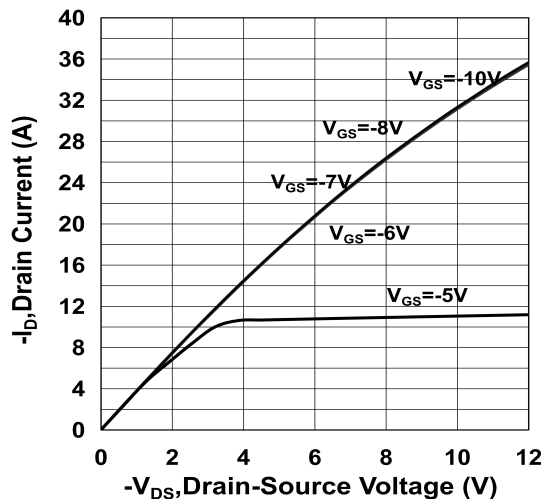
On-Region Characteristic@25°C



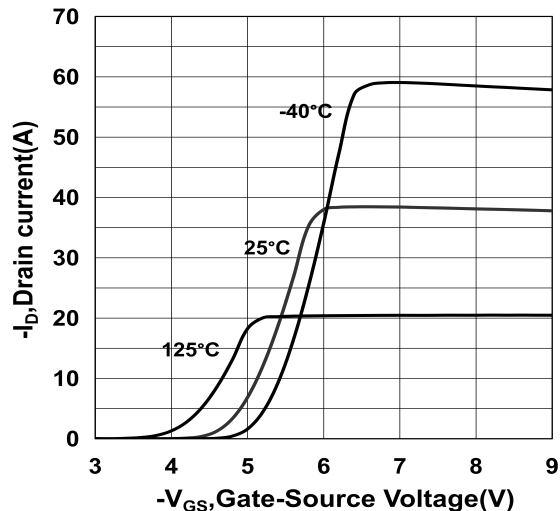
Extended On-Region Characteristic@25°C



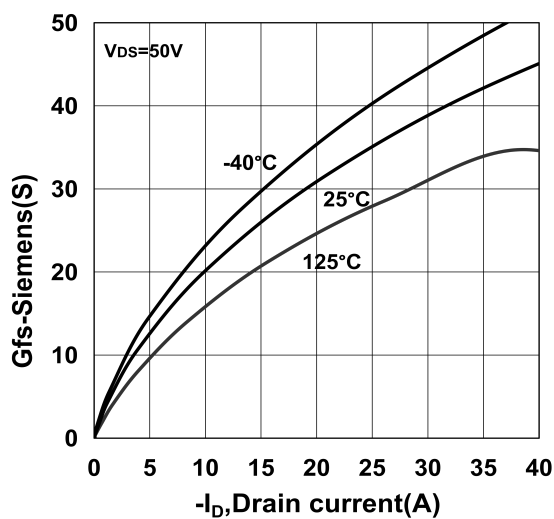
On-Region Characteristic@125°C



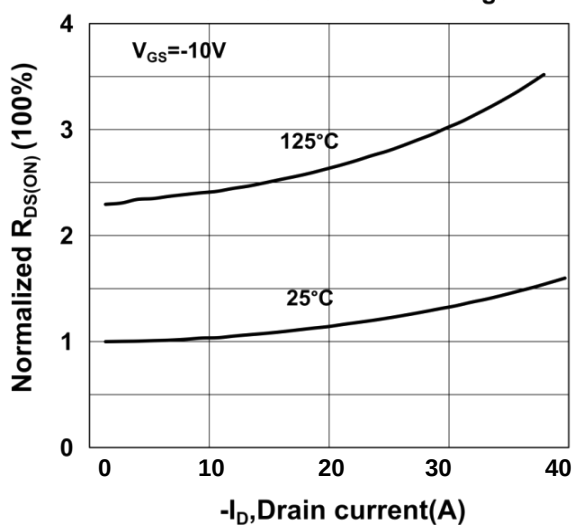
Transfer Characteristics



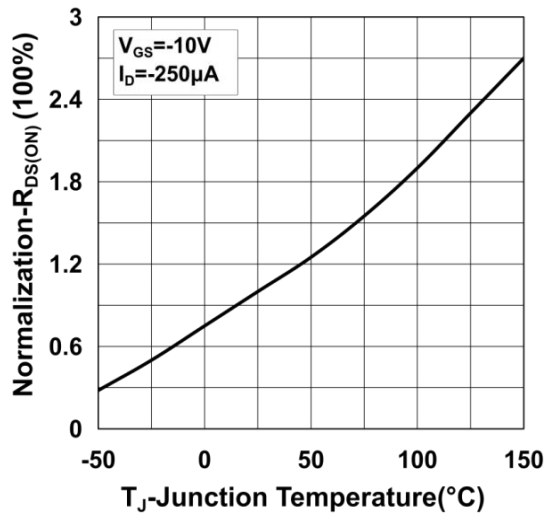
Transconductance



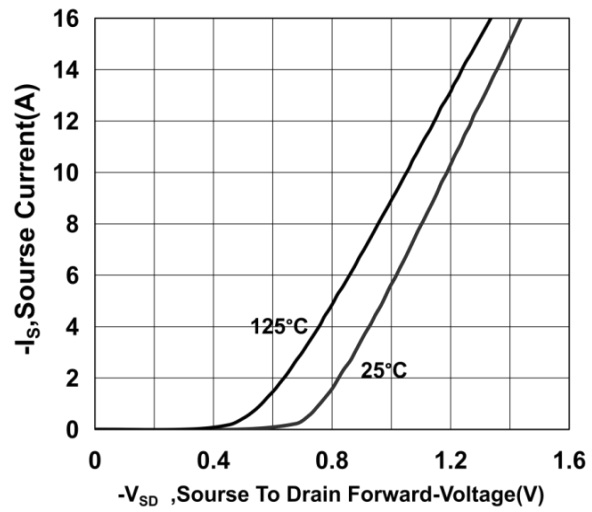
Normalized On-Resistance Variation vs Drain Current and Gate Voltage



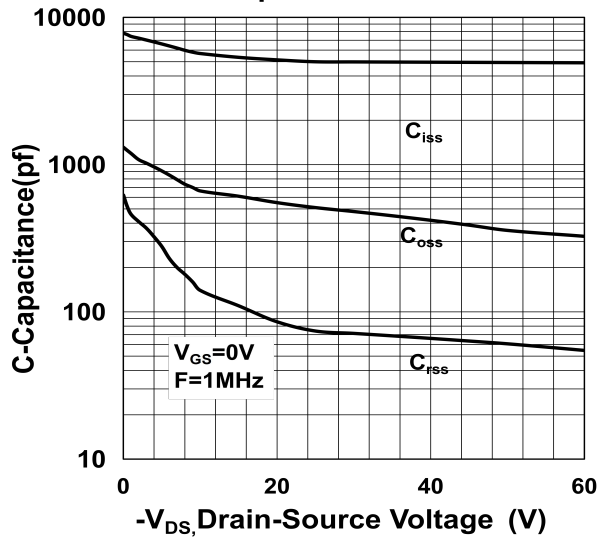
Normalization On-Resistance
Variation vs Junction Temperature



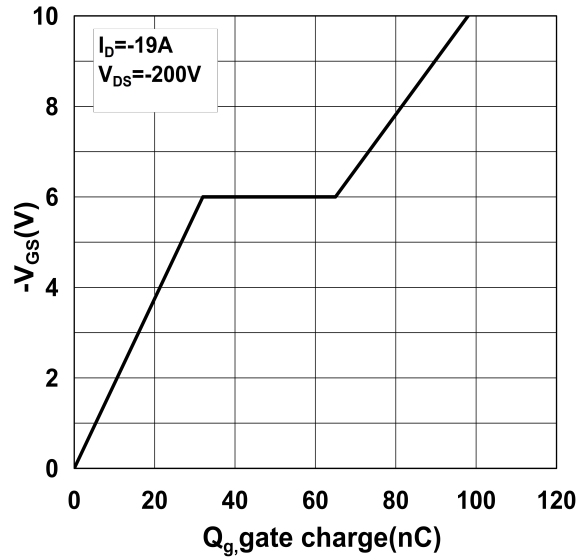
Body Diode Forward Voltage Variation
with Source Current and Temperature



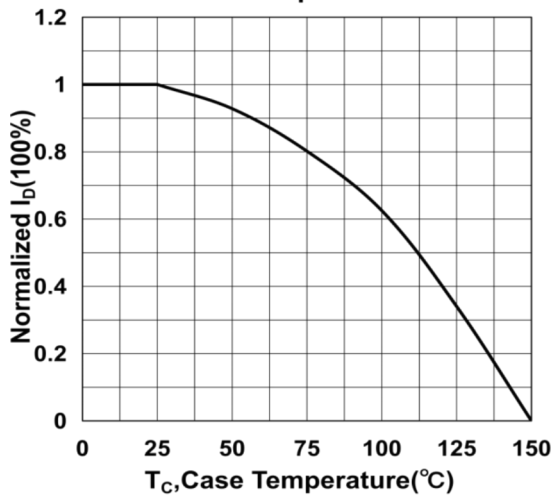
Capacitance



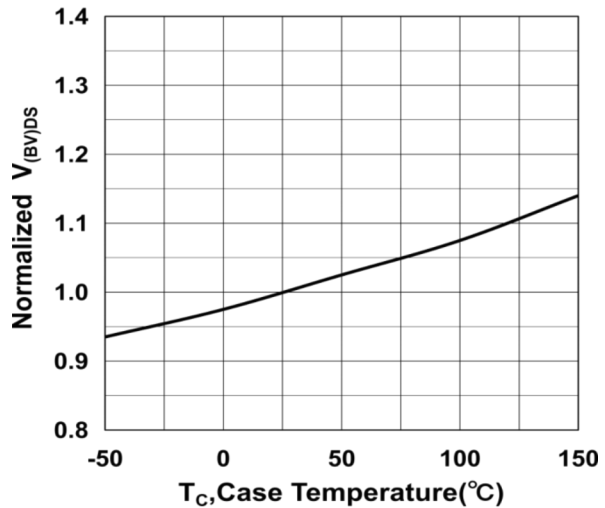
Gate Charge



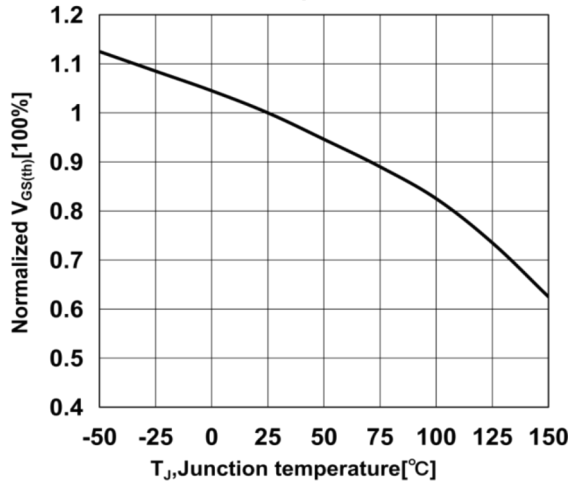
Maximum Drain Current vs
Case Temperature



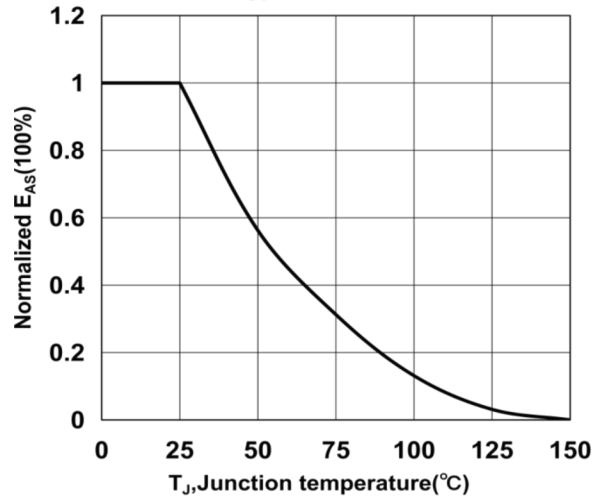
Normalized V_{(BV)DS} vs temperature



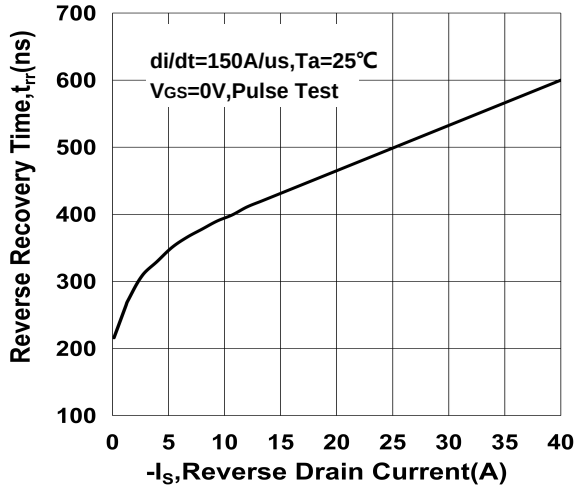
Normalized gate threshold voltage
vs temperature



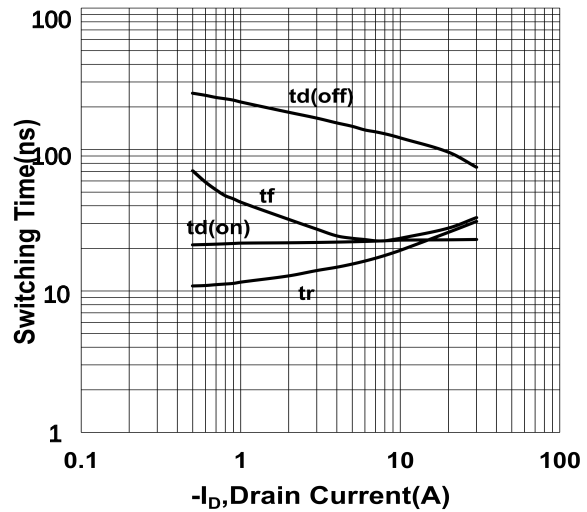
Normalized maximum avalanche
energy vs temperature



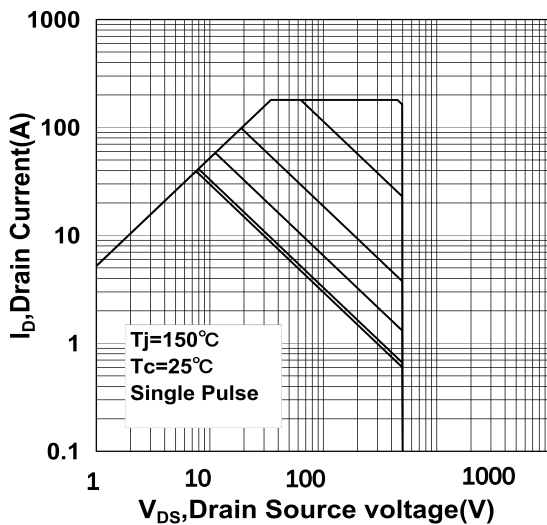
Body Diode Reverse Recovery
Time vs Source to Drain Current



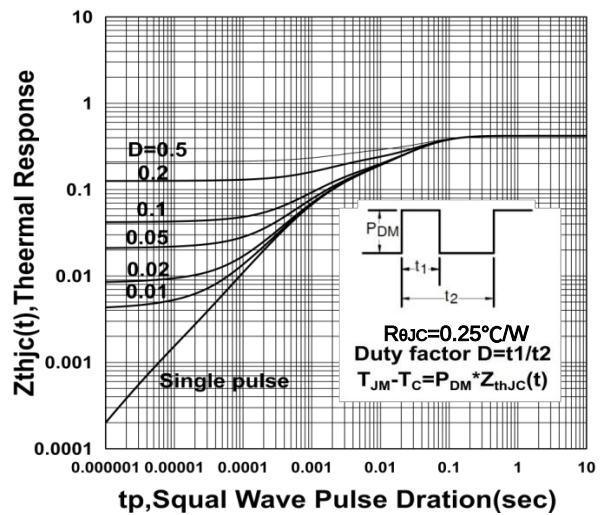
Switching Characteristics



Safe Operating Area



Transient response Curve



Package Mechanical DATA

