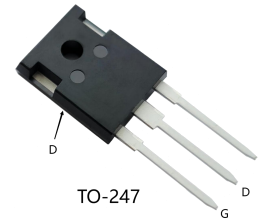


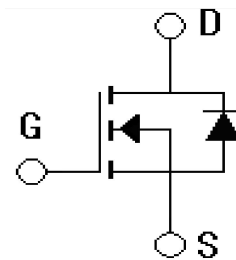
Features

- Fast Intrinsic Rectifier
- $V_{DS}=500V, I_D=60A$
 $R_{DS(on)} \leq 138m\Omega @ V_{GS}=10V$
- 100% avalanche tested
- Low package Inductance
- High Power density
- performance and reliable operation



Applications

- Switch-Mode and Resonant-Mode Power Supplies
- DC-DC Converters
- Laser Drivers
- AC and DC Motor Drives
- Robotics and Servo Controls



Absolute Ratings ($T_c=25^\circ C$)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DSS}	500	V
Transient Gate-Source Voltage	V_{GSM}	± 30	V
Continuous Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current-continuous	I_D	$T_C=25^\circ C$	A
		$T_C=100^\circ C$	
Drain Current-pulse(note 1)	I_{DM}	180	A
Single Pulsed Avalanche Energy(note 2)	E_{AS}	3920	mJ
Avalanche Current, Repetitive or Non-Repetitive	I_{AR}	28	A
Maximum Power Dissipation	P_D	297	W
Operating and Storage Temperature Range	T_J, T_{STG}	$-55 \sim +150$	$^\circ C$
Maximum lead temperature for soldering plastic body for 10s	T_L	300	$^\circ C$

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

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	500	-	-	V
Zero Gate Voltage Drain	I_{DSS}	$V_{DS}=V_{DSS}, V_{GS}=0V$	-	-	25	μA

Current						
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On-Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.5	3.8	5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =10A (note 3)	-	108	138	mΩ
Forward Transconductance	g _{fs}	V _{DS} =50V, I _D =10A (note 3)	-	28.8	-	S
Dynamic Characteristics						
Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	6.3	-	nF
Output capacitance	C _{oss}		-	840	-	pF
Reverse transfer capacitance	C _{rss}		-	65	-	pF
Switching-Characteristics						
Turn-On delay time	t _{d(on)}	V _{DS} =250V, I _D =30A, R _g =2.2Ω, V _{GS} =15V (note 4)	-	25	-	ns
Turn-On rise time	t _r		-	35	-	ns
Turn-Off delay time	t _{d(Off)}		-	40	-	ns
Turn-Off rise time	t _f		-	10	-	ns
Total Gate Charge	Q _g	V _{DS} =250V, I _D =30A, V _{GS} =0-10V	-	110	-	nC
Gate-Source charge	Q _{gs}		-	35	-	nC
Gate-Drain charge	Q _{gd}		-	32	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =1A	-	0.62	1.0	V
Diode Forward Current	I _S	T _C =25℃	-	-	60	A
Reverse recovery time	T _{rr}	I _S =30A, di/dt=100A/μs V _R =100V, V _{GS} =0V (note 3)	-	200	260	ns
Reverse recovery charge	Q _{rr}		-	1.12	-	μC

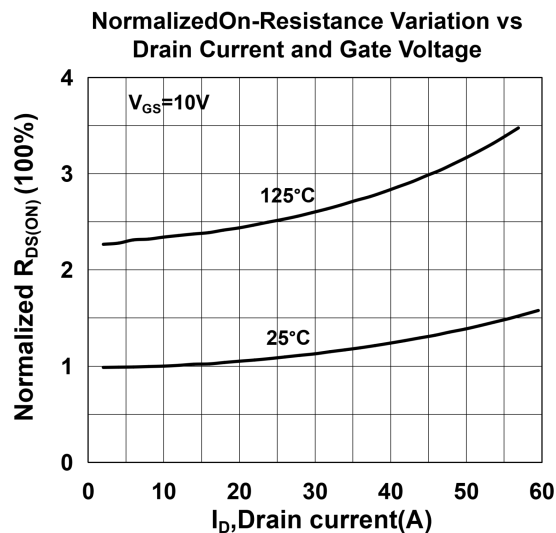
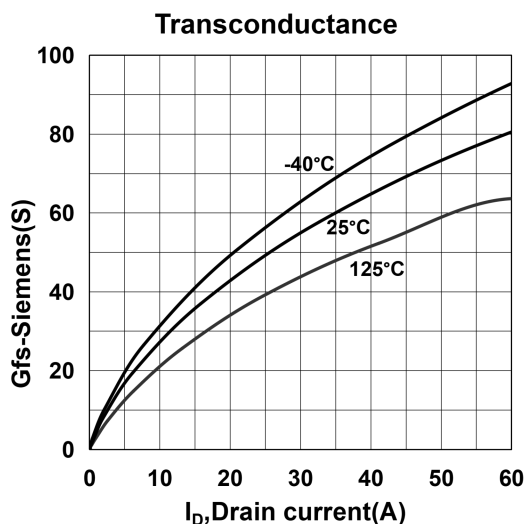
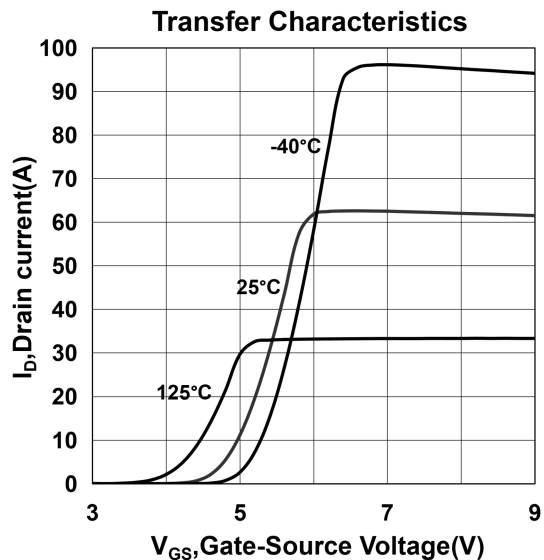
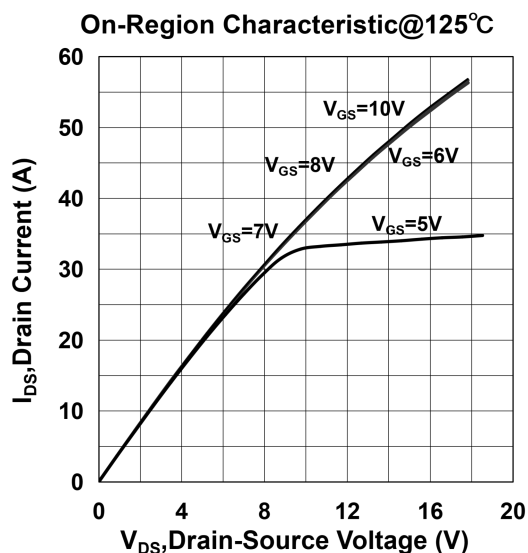
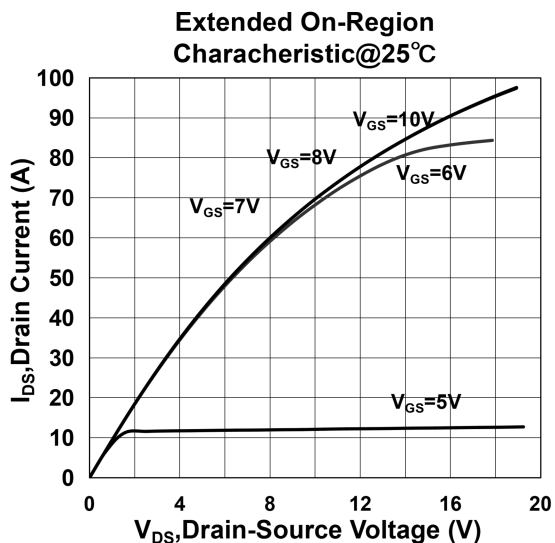
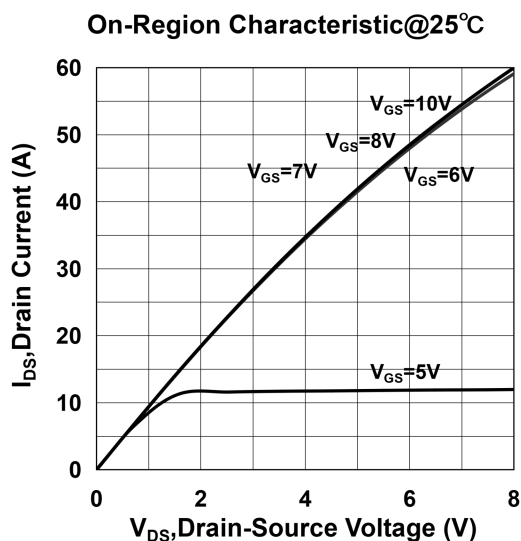
Thermal Characteristic

Parameter	Symbol	Value	Unit
Thermal Resistance, junction to Case, Max	$R_{th(j-C)}$	0.42	$^\circ C/W$
Thermal Resistance, Junction to Ambient, Max	$R_{th(j-A)}$	40	

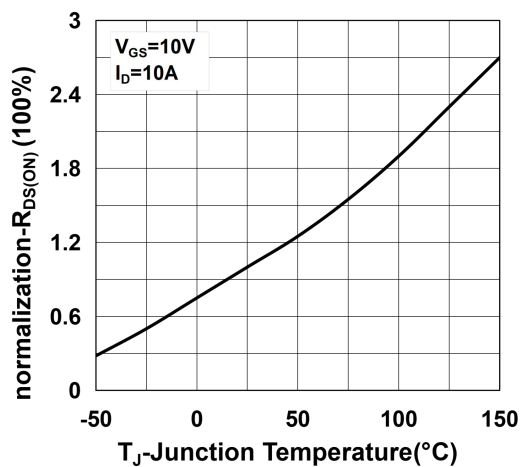
Notes:

1. Repetitive Rating: Pulse width and case temperature limited by maximum junction temperature.
2. Starting at $T_J = 25^\circ C$, $L = 10mH$, $R_G = 25\Omega$, $I_{AS} = 28A$.
3. Pulse test: Pulse Width < 300 μs , duty cycle < 2%
4. R_G is external gate resistance, not including internal gate resistance or gate driver impedance.

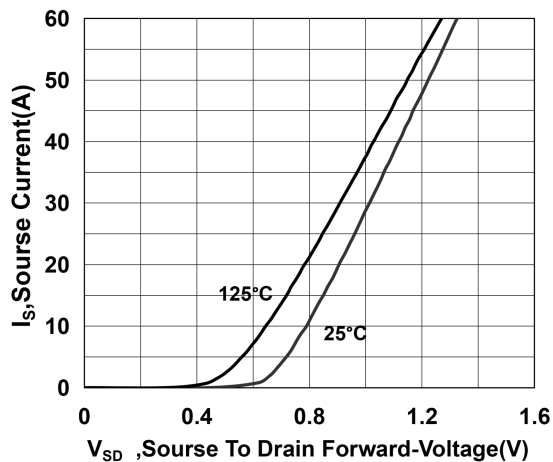
Electrical Characteristics



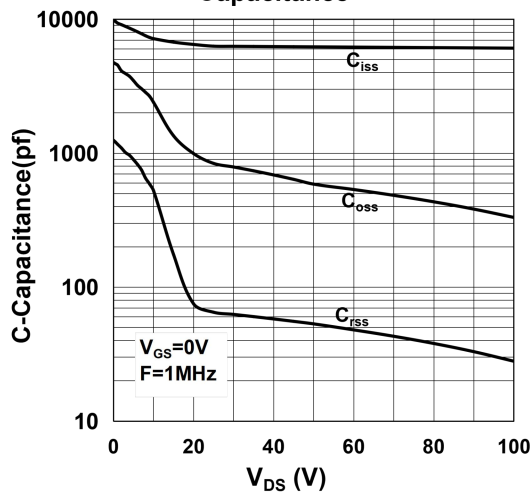
Normalization On-Resistance
Variation vs Junction Temperature



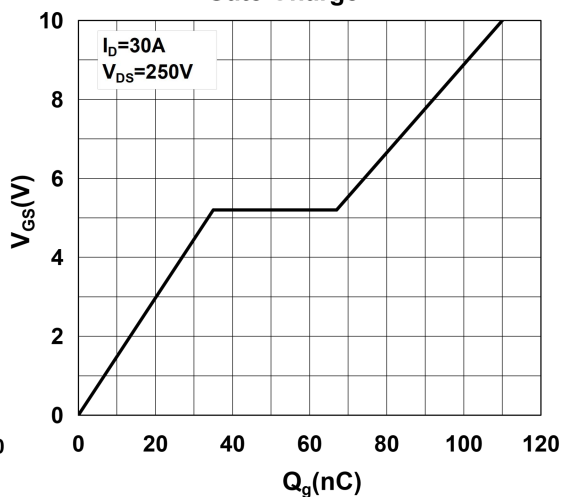
Body Diode Forward Voltage Variation
with Source Current and Temperature



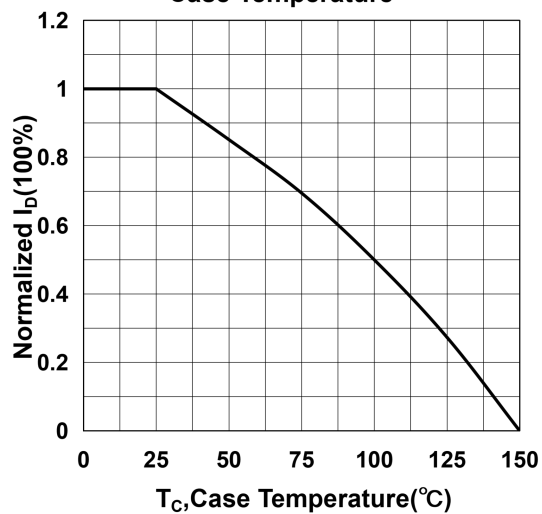
Capacitance



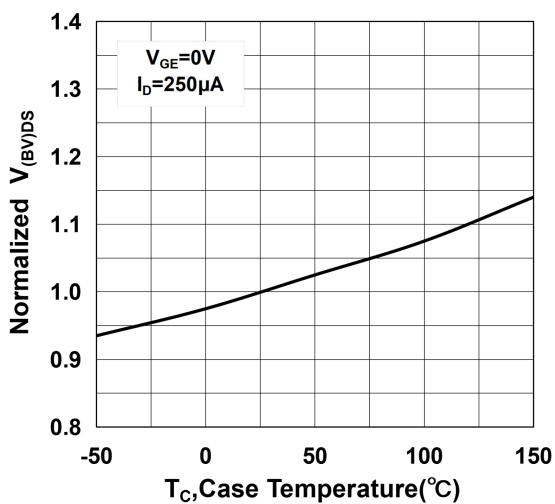
Gate Charge



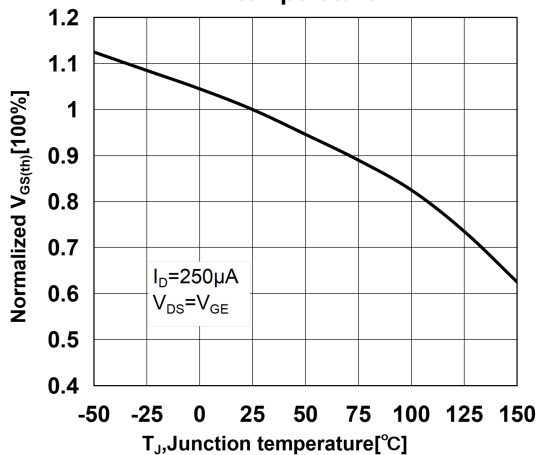
Maximum Drain Current vs
Case Temperature



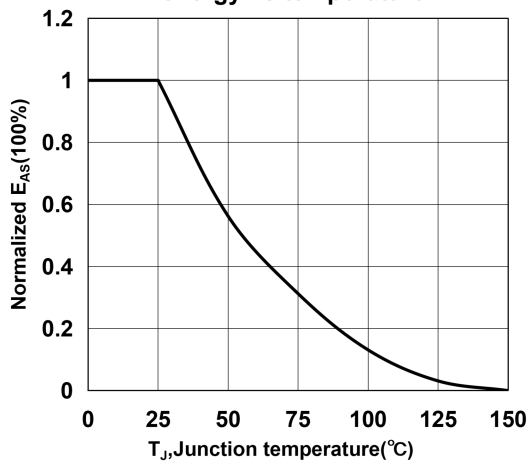
Normalized $V_{(BV)DS}$ vs temperature



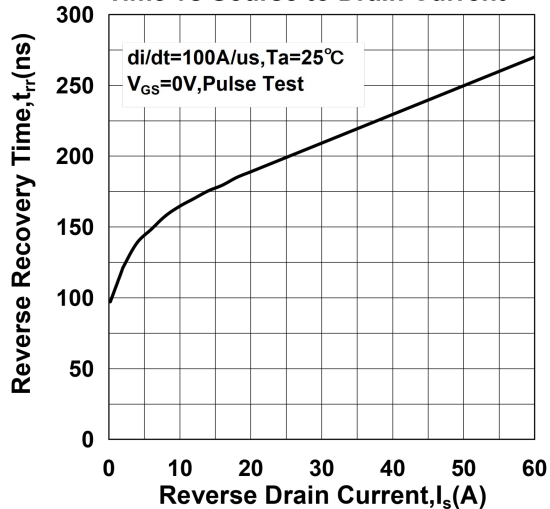
Normalized gate threshold voltage vs temperature



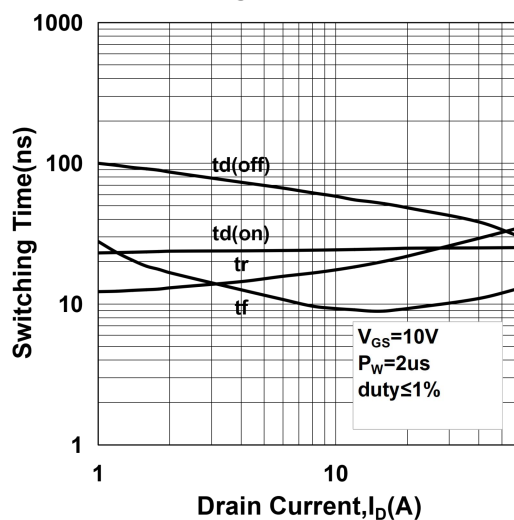
Normalized maximum avalanche energy vs temperature



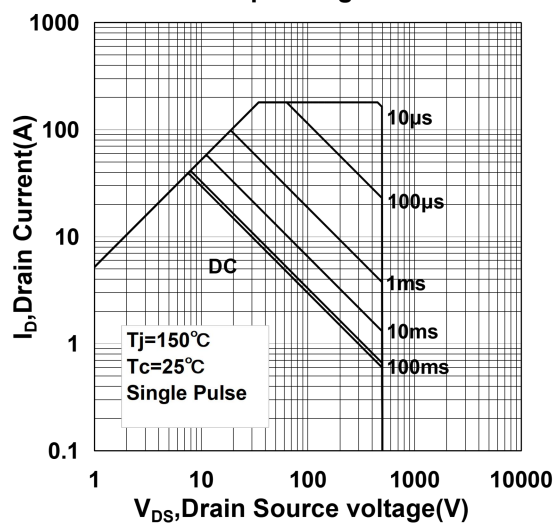
Body Diode Reverse Recovery Time vs Source to Drain Current



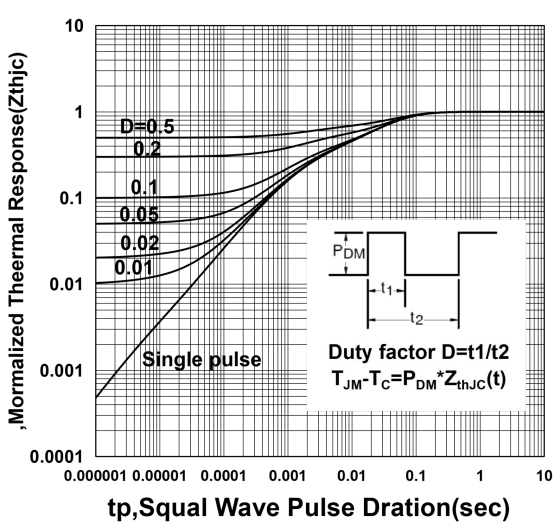
Switching Characteristics



Safe Operating Area



Normalized Transient response Curve



Package Mechanical DATA

