

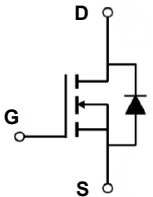
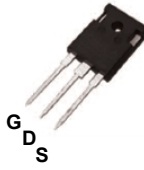
Features

- $V_{DS}=80V, I_D=196A$
 $R_{ds(on)}(typ)=3m\Omega @ V_{gs}=10V$
- 100% Avalanche Tested
- 100% Rg Tested
- Lead-Free (RoHS Compliant)

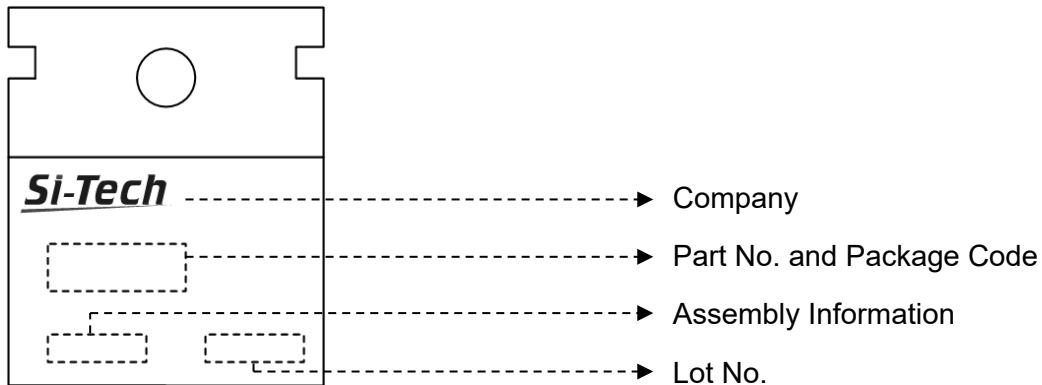
Applications

- DC Motor Control
- DC-DC Converters
- BMS
- SMPS
- Automotive Environment

Internal Circuit and Pin Description

	
Package	TO-247
Package Code	T

Package Marking



Absolute Maximum Ratings ($T_C=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	80	V
I_D	Continuous Drain Current ($T_C=25^{\circ}C$)	196	A
	Continuous Drain Current ($T_C=100^{\circ}C$)	124	A
I_{DM}	Pulsed Drain Current (Note 1)	784	A
V_{GS}	Gate-Source Voltage	± 25	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	1122	mJ
P_D	Maximum Power Dissipation ($T_C=25^{\circ}C$)	290	W
	Derating Factor above $25^{\circ}C$	2.32	W/ $^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to +150	$^{\circ}C$
T_{STG}	Storage Temperature Range	-55 to +150	$^{\circ}C$

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{th\ j-c}$	Thermal Resistance, Junction to case	0.43	$^{\circ}C/W$

Electrical Characteristics ($T_c=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	80	-	-	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=76V, V_{GS}=0V$	-	-	1	μA
I_{GSS}	Gate Leakage Current, Forward	$V_{GS}=25V, V_{DS}=0V$	-	-	100	nA
	Gate Leakage Current, Reverse	$V_{GS}=-25V, V_{DS}=0V$	-	-	-100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	2.4	3	3.6	V
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS}=10V, I_D=40A$	2.4	3	3.6	$m\Omega$
Q_g	Total Gate Charge	$V_{DD}=60V$	-	180	-	nC
Q_{gs}	Gate-Source Charge	$V_{GS}=10V$	-	35	-	nC
Q_{gd}	Gate-Drain Charge	$I_D=40A$ (Note 3)	-	67	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=37.5V, V_{GS}=10V$	-	28	-	ns
t_r	Turn-on Rise Time	$I_D=45A, R_G=4.7\Omega$	-	19	-	ns
$t_{d(off)}$	Turn-off Delay Time	$T_c=25^{\circ}C$	-	42	-	ns
t_f	Turn-off Fall Time	(Note 3)	-	53	-	ns
R_g	Gate Resistance	$V_{DS}=0V, V_{GS}=0V, f=1MHz$	-	1.1	-	Ω
C_{iss}	Input Capacitance	$V_{DS}=25V$	-	7823	-	pF
C_{oss}	Output Capacitance	$V_{GS}=0V$	-	1068	-	pF
C_{rss}	Reverse Transfer Capacitance	$f = 1MHz$	-	699	-	pF

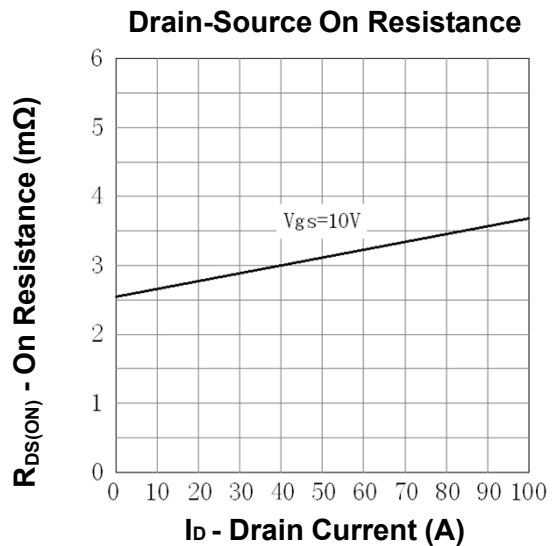
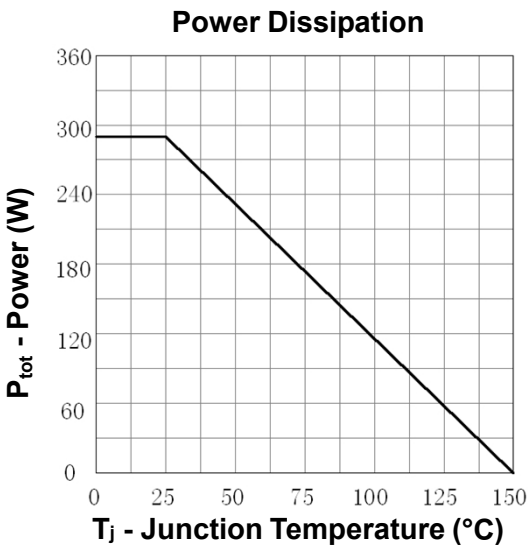
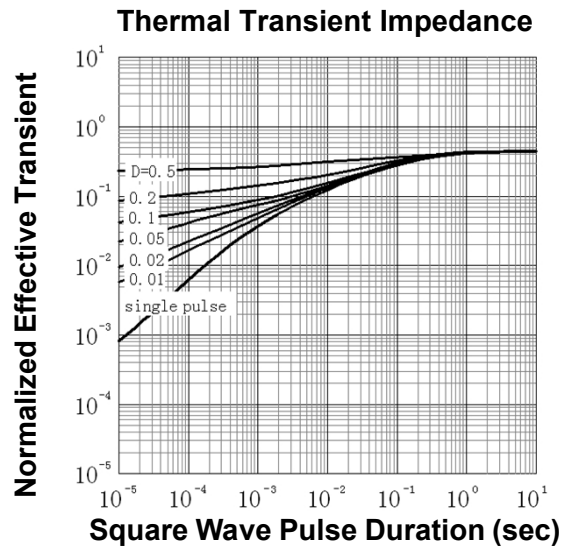
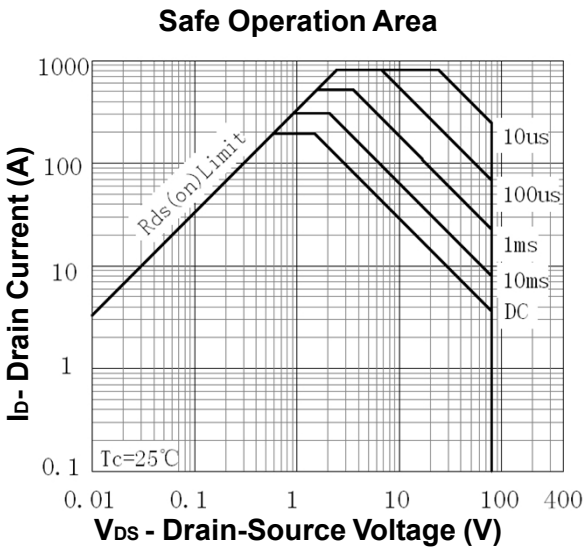
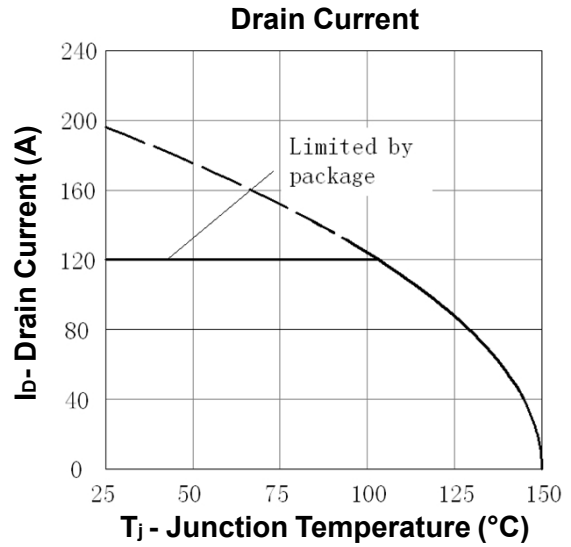
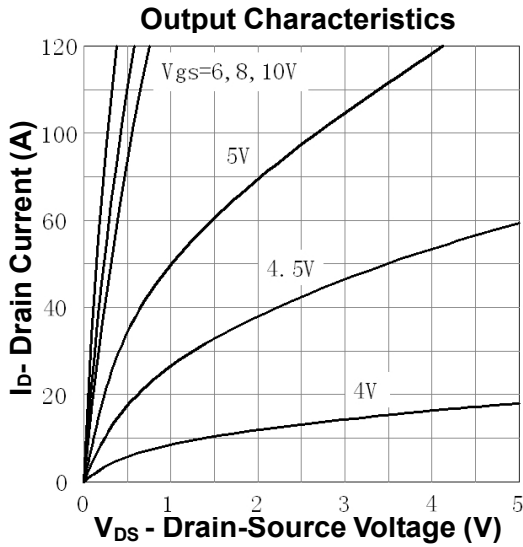
Source-Drain Diode Characteristics ($T_c=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
I_S	Continuous Source Diode Forward Current		-	-	196	A
I_{SM}	Pulsed Source Diode Forward Current (Note 1)		-	-	784	A
V_{SD}	Forward On Voltage	$V_{GS}=0V, I_S=45A$	-	0.82	1	V
t_{rr}	Reverse Recovery Time	$V_{GS}=0V, I_S=45A$	-	30	-	ns
Q_{rr}	Reverse Recovery Charge	$dI_F/dt = 100A/\mu s$	-	54	-	nC

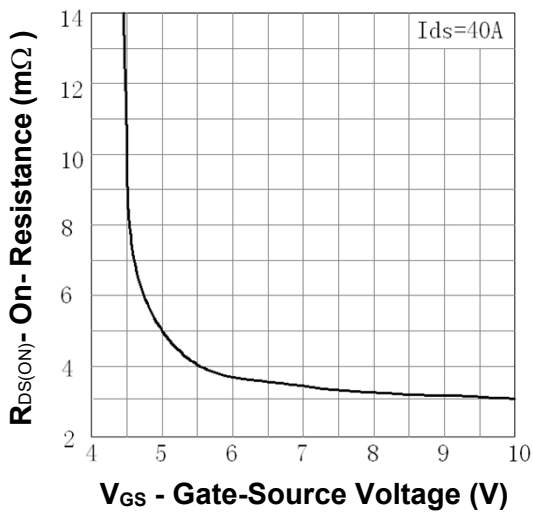
Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $L=0.5mH, V_{DD}=64V, R_G=25\Omega$, Starting $T_J=25^{\circ}C$
3. Pulse Width $\leq 300\mu s$; Duty Cycle $\leq 2\%$

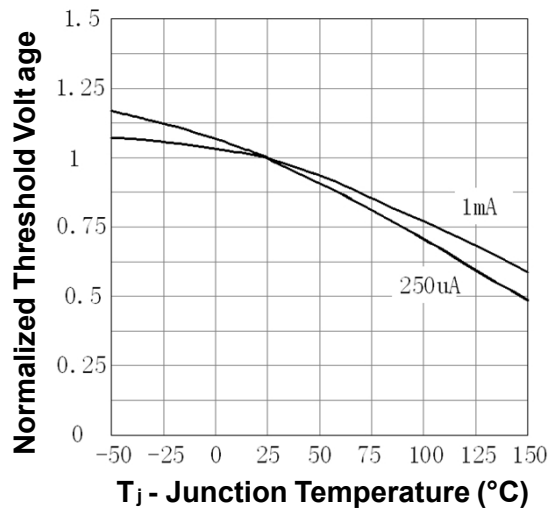
Typical Characteristics



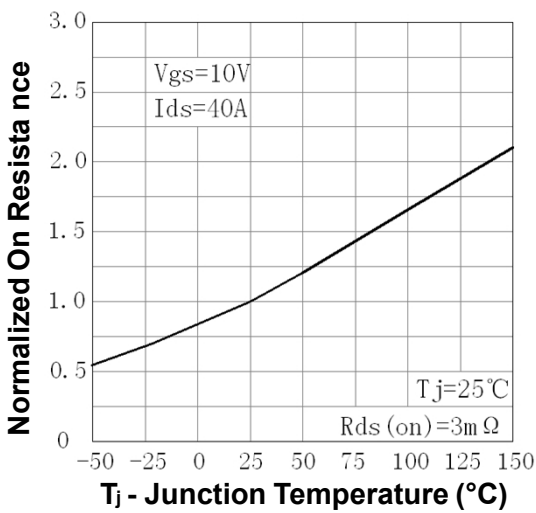
Drain-Source On Resistance



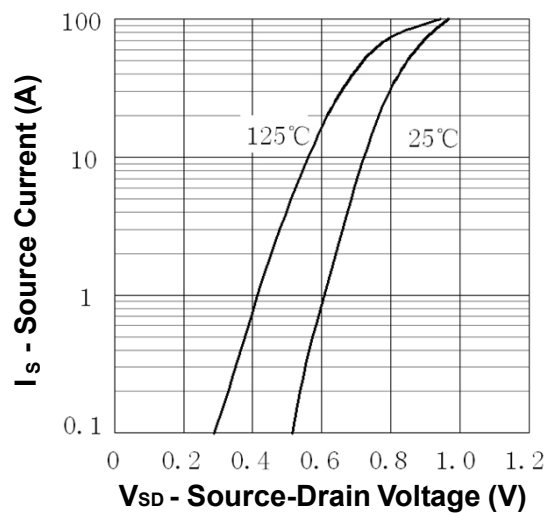
Gate Threshold Voltage



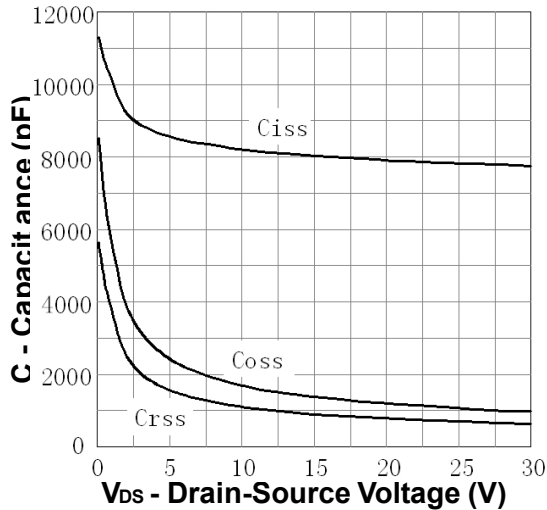
Drain-Source On Resistance



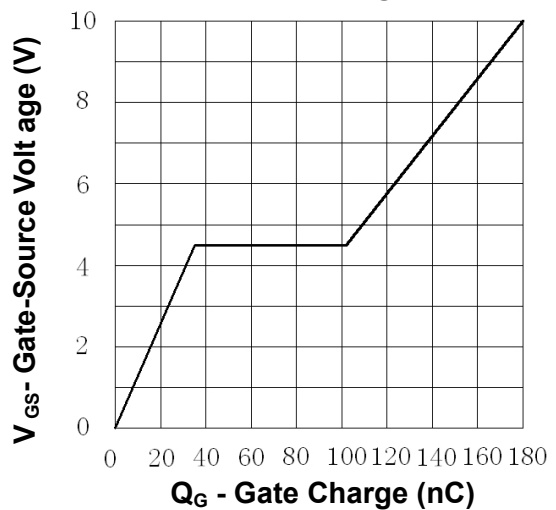
Source-Drain Diode Forward



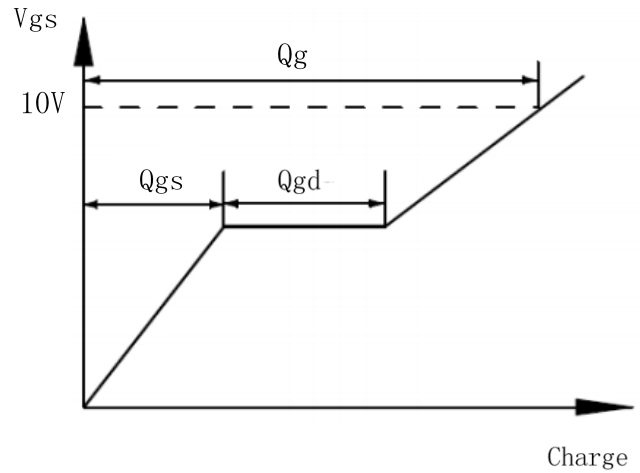
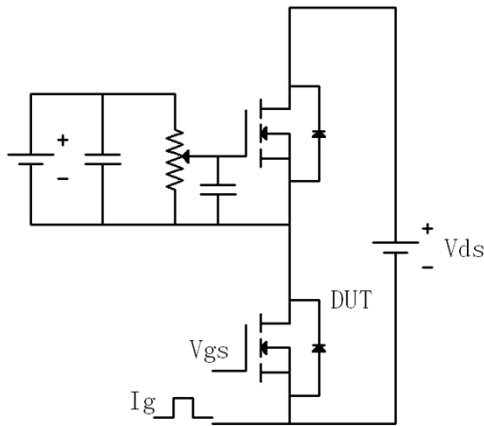
Capacitance



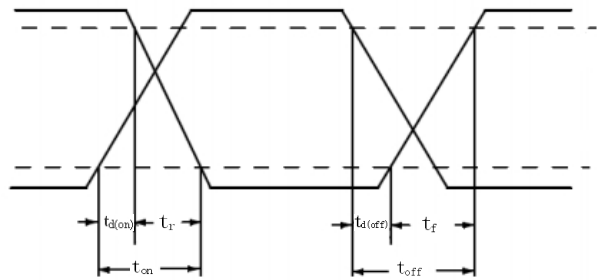
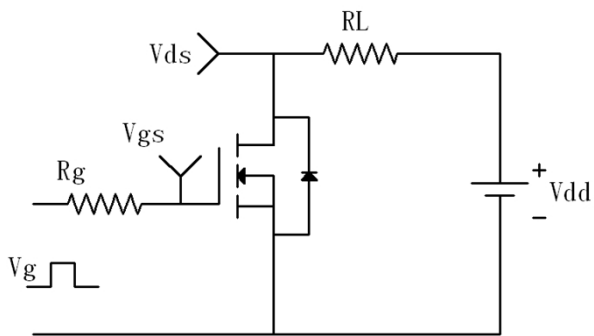
Gate Charge



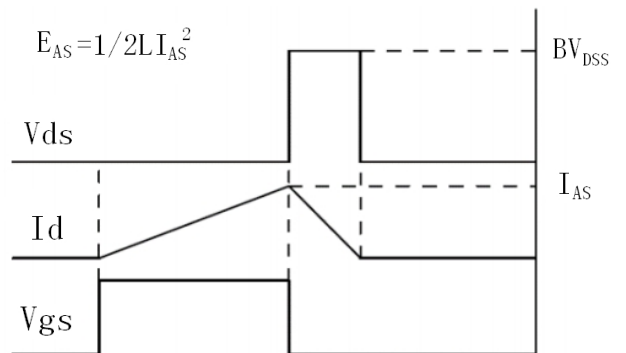
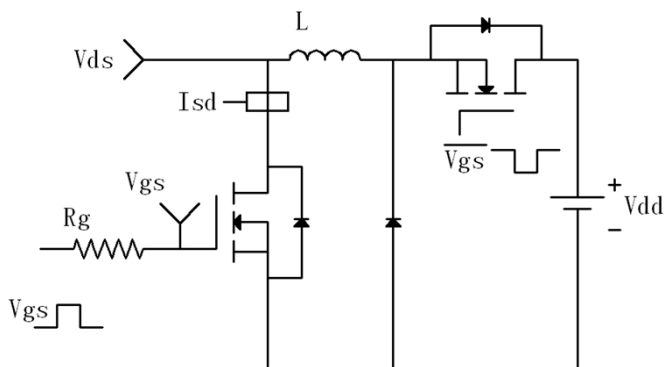
Gate Charge Test Circuit and Waveforms



Switching Time Test Circuit & Waveforms

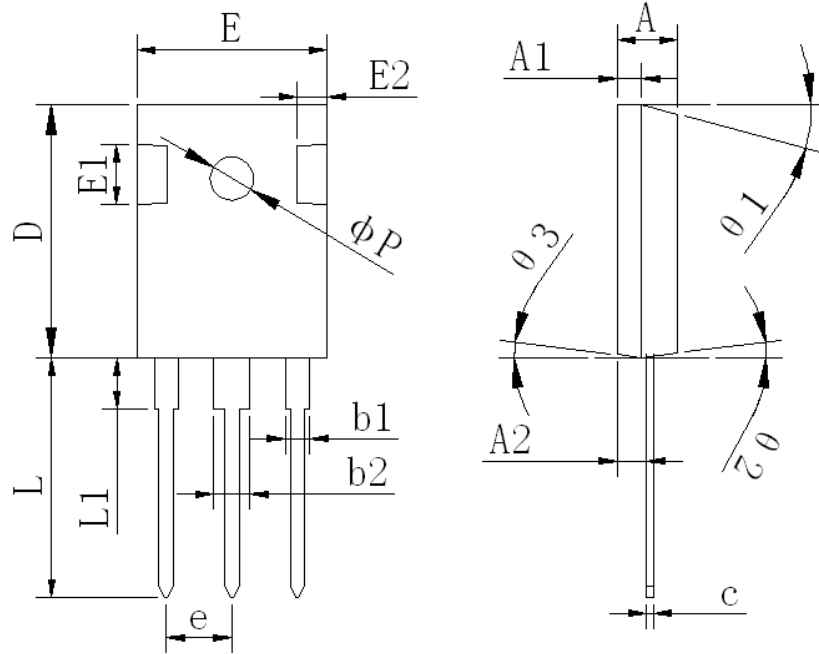


Avalanche Test Circuit & Waveforms



Package Outline

TO247



UNIT:mm

SYMBOL	MIN	NOM	MAX
A	4.92	5.00	5.08
A1	1.97	2.00	2.03
A2	2.36	2.41	2.46
b1	1.98	2.00	2.02
b2	2.98	3.00	3.02
c	0.59	0.60	0.61
E	15.75	15.80	15.85
E1	5.75	5.80	5.85
E2	2.45	2.50	2.55
e	5.44 BSC		
D	20.70	21.00	21.30
L	19.62	19.92	20.22
L1	-	-	4.30
ϕP	3.55	3.60	3.65
$\theta 1$	13°	15°	17°
$\theta 2$	5°	7°	9°
$\theta 2$	5°	7°	9°