

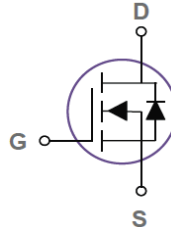
N-Channel Enhancement Power MOSFET

Features

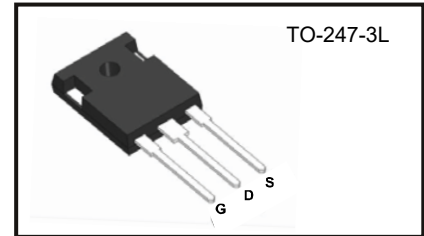
- Uses advanced SGT technology
- Extremely low on-resistance $R_{DS(on)}$
- Excellent FOM(Figure of Merits), Gate Charge $Q_g \times R_{DS(on)}$

Applications

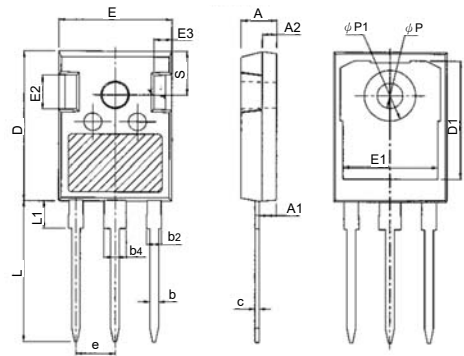
- Motor control and drives
- Battery management
- DC/DC converter
- General purpose applications



V_{DSS}	100V
$I_D(@25^\circ\text{C})$	272A
$R_{DS(ON)}$ typ.	1.8m Ω



Package Dimensions



Absolute Maximum Ratings

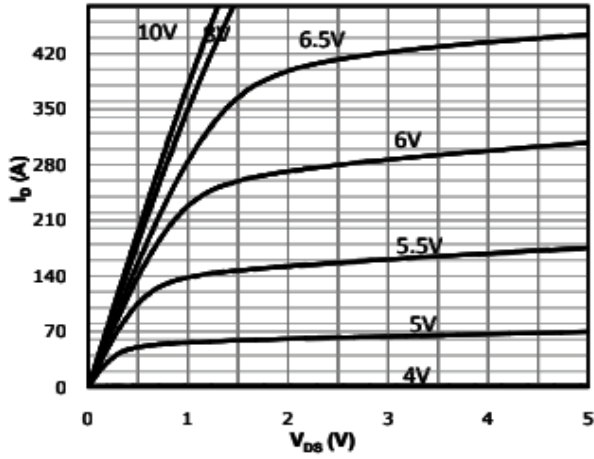
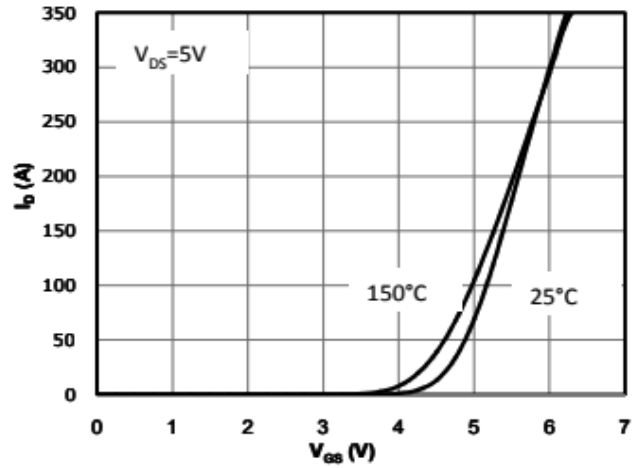
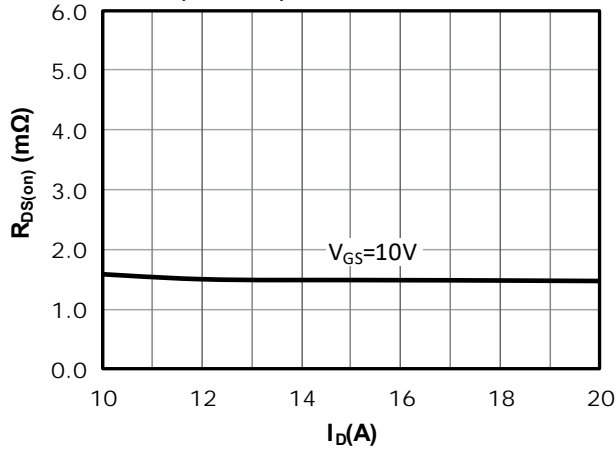
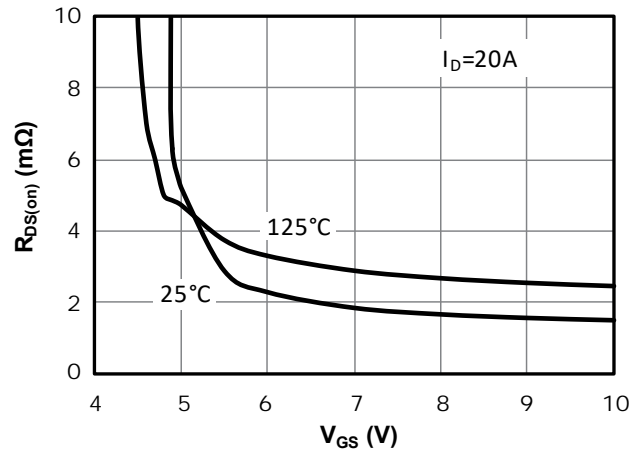
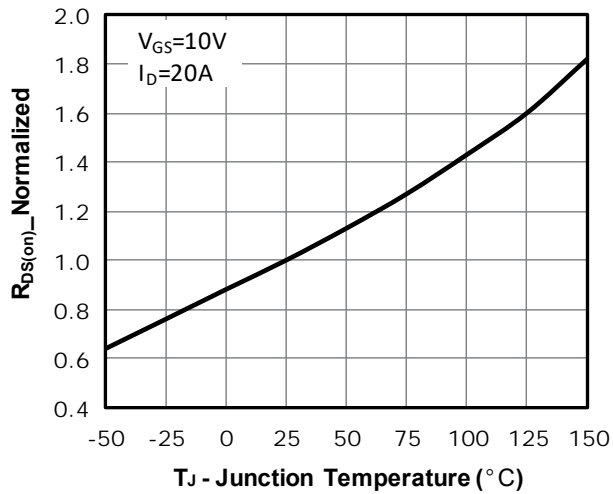
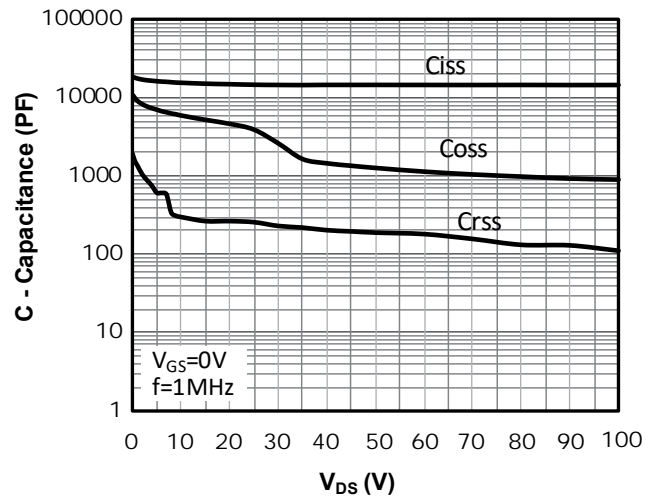
($T_c = 25^\circ\text{C}$ unless otherwise specified)

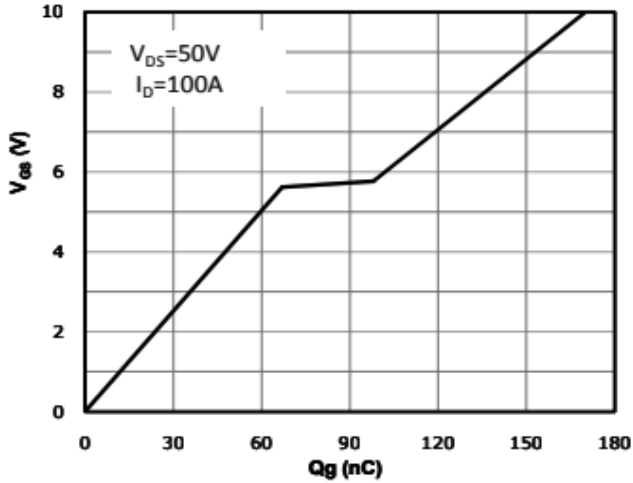
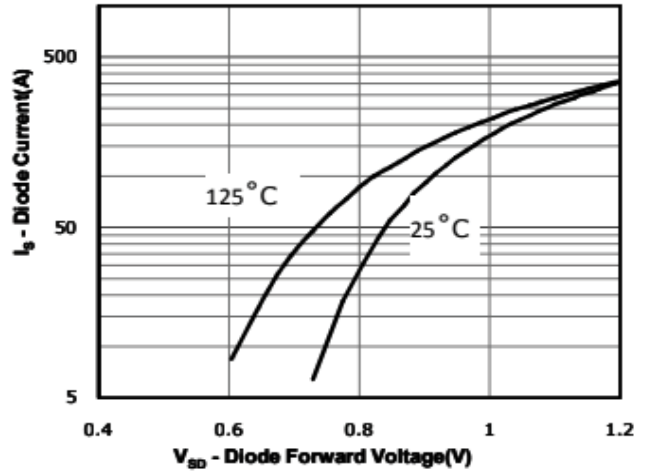
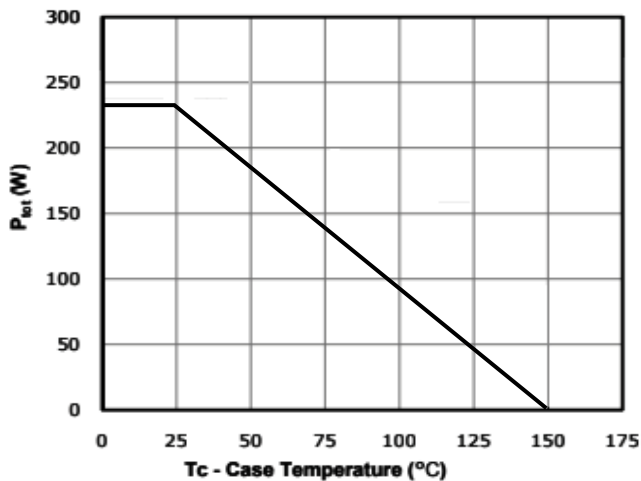
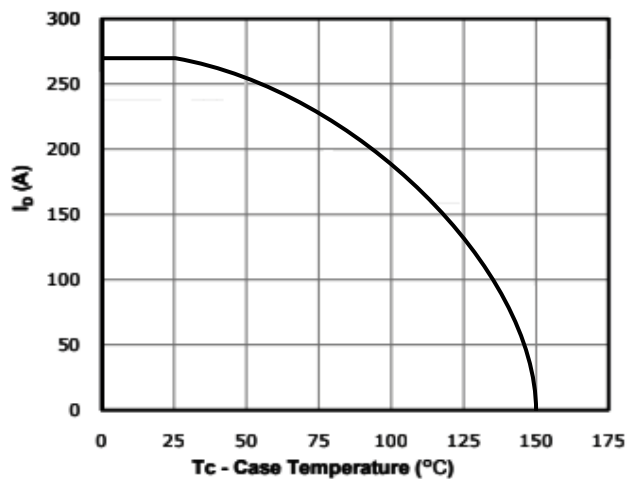
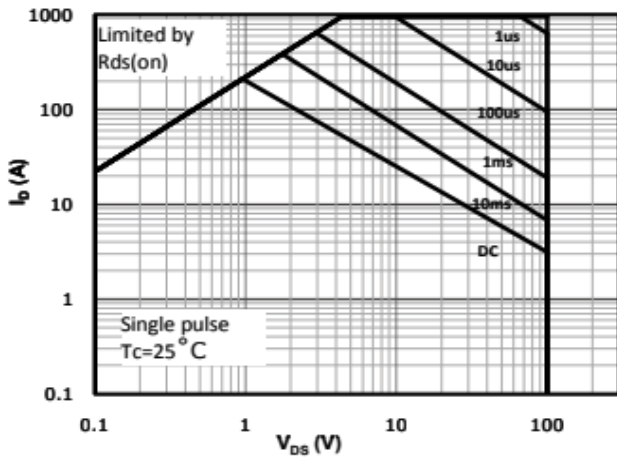
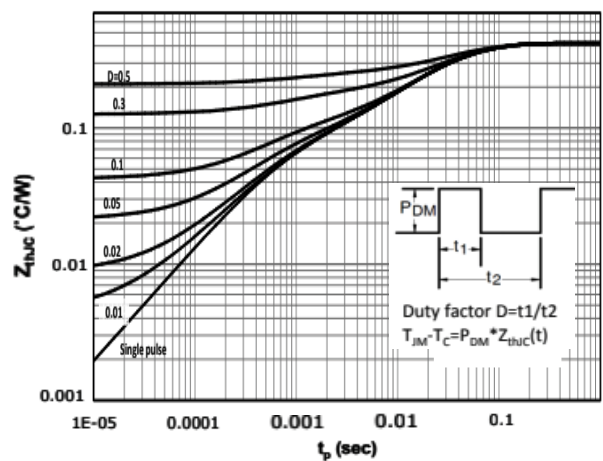
Parameter	Symbol	Ratings	Unit
Drain Source Voltage	V_{DS}	100	V
Gate Source Voltage	V_{GS}	± 20	V
Drain Current Continuous	I_D	272 177	A
	@ $T_c = 25^\circ\text{C}$ @ $T_c = 100^\circ\text{C}$		
Drain Current Pulsed	I_{DM}	840	A
	$T_c = 25^\circ\text{C}$, tp limited by T_J max.		
Single Pulse Avalanche Energy	E_{AS}	2180	mJ
	L=0.5mH Rg=25 Ω		
Power Dissipation	P_D	230	W
	@ $T_c = 25^\circ\text{C}$		
Storage Temperature Range	T_{STG}	-55 to +150	$^\circ\text{C}$
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ\text{C}$
Thermal Resistance Junction to Case	$R_{\theta Jc}$	0.54	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	60	$^\circ\text{C/W}$

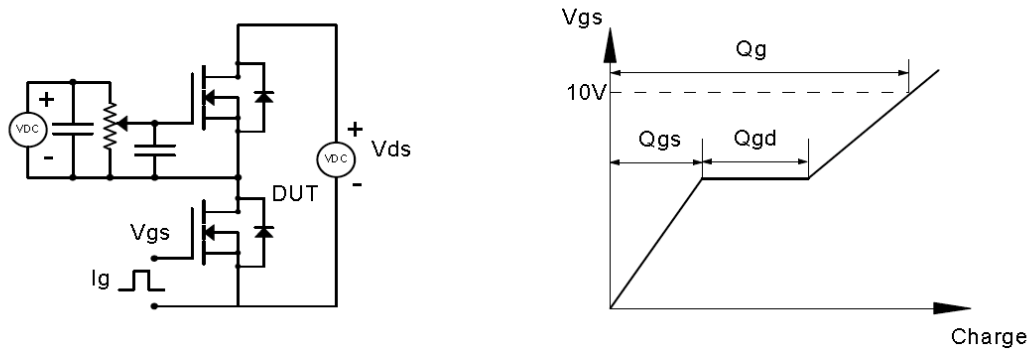
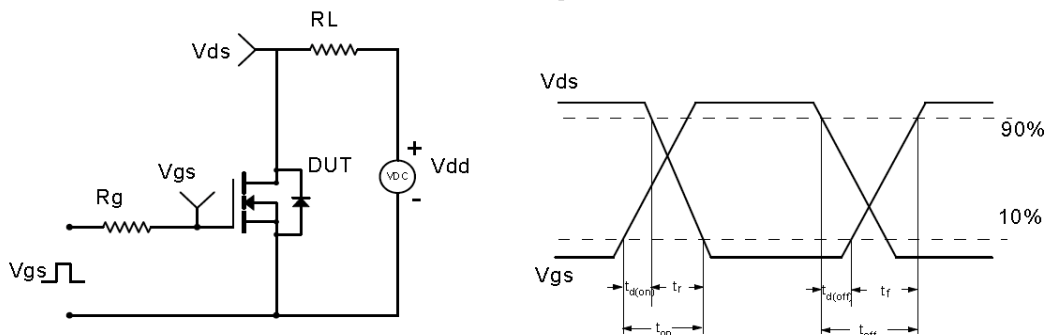
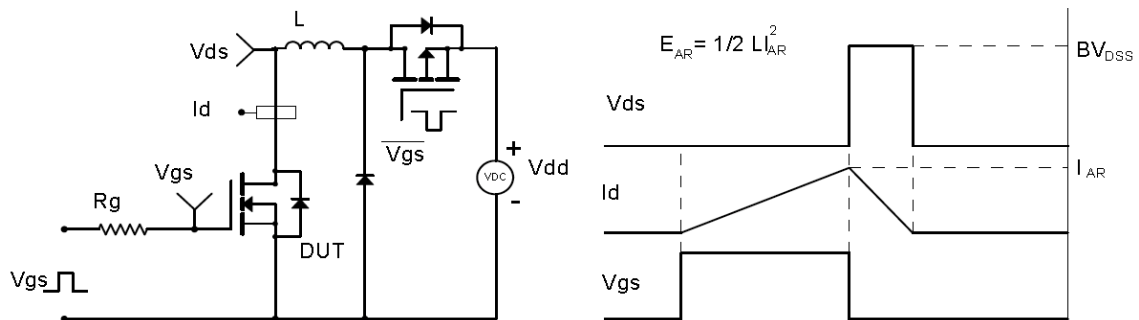
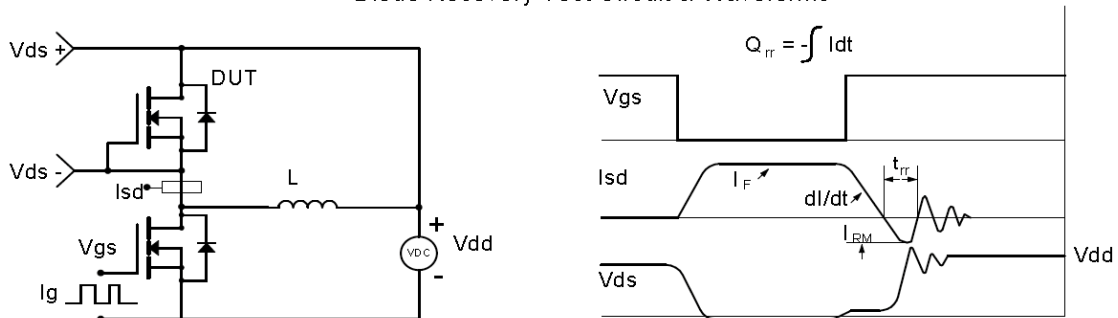
UNIT:mm			
Symbol	Min.	Nom	Max.
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.61	0.75
D	20.70	21.00	21.30
D1	16.25	16.55	16.85
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e	5.44BSC		
L	19.62	19.92	20.22
L1	-	-	4.30
ϕP	3.40	3.60	3.80
$\phi P1$	-	-	7.30
S	6.15BSC		

Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
OFF Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_{DS} = 0.25mA$	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0V, V_{DS} = 100V, T_J = 25^\circ\text{C}$	-	-	1	μA
		$V_{GS} = 0V, V_{DS} = 80V, T_J = 125^\circ\text{C}$	-	-	10	μA
Gate-source leakage current	I_{GSS}	$V_{GS} = 20V, V_{DS} = 0V$	-	-	100	nA
ON Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 0.25mA$	2.0	3.0	4.0	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 50A$	-	1.8	2.2	m Ω
Internal Gate Resistance	R_g	$V_{DS} = V_{GS} = 0V, f = 1.0MHz$	-	1.6	-	Ω
Forward Transconductance	g_{fs}	$V_{DS} = 5V, I_D = 50A$	170	-	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 50V$	-	14510	-	pF
Output Capacitance	C_{oss}	$V_{GS} = 0V$	-	1265	-	
Reverse Transfer Capacitance	C_{rss}	Freq. = 1.0MHz	-	189	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = 50V$ $V_{GS} = 10V$ $R_L = 3\Omega$ $T_J = 25^\circ\text{C}$	-	37	-	ns
Rise Time	t_r		-	112	-	
Turn-Off Delay Time	$t_{d(off)}$		-	85	-	
Fall Time	t_f		-	115	-	
Total Gate Charge	Q_g	$V_{DS} = 50V$	-	165	-	nC
Gate to Source Charge	Q_{gs}	$V_{GS} = 10V$	-	67	-	
Gate to Drain Charge	Q_{gd}	$I_{DS} = 40A$	-	35	-	
Body Diode Characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 50A$	-	-	1.2	V
Reverse Recovery Time	T_{rr}	$I_S = 30A, T_J = 25^\circ\text{C}$	-	112	-	ns
Reverse Recovery Charge	Q_{rr}	$di/dt = 500A/\mu\text{s}$	-	323	-	nC

Typical Performance Characteristics
Fig 1: Output Characteristics

Fig 2: Transfer Characteristics

Fig 3: Rds(on) Vs Ids Characteristics (Tc=25°C)

Fig 4: Rds(on) vs Gate Voltage

Fig 5: Rds(on) vs. Temperature

Fig 6: Capacitance Characteristics


Typical Performance Characteristics
Fig 7: Gate Charge Characteristics

Fig 8: Body-diode Forward Characteristics

Fig 9: Power Dissipation

Fig 10: Drain Current Derating

Fig 11: Safe Operating Area

Fig 12: Max. Transient Thermal Impedance


Typical Performance Characteristics
Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveforms

Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

Diode Recovery Test Circuit & Waveforms


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