Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
1200V	35mΩ@18V	50A

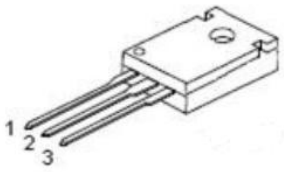
Feature

- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low RDS(on)
- Easy to Parallel
- Simple to Drive
- RoHS Compliantt

Applications

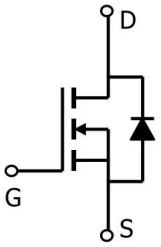
- Power Factor Correction Modules
- Switch Mode Power Supplies
- DC-AC Inverters
- High Voltage DC/DC Converterst

Package

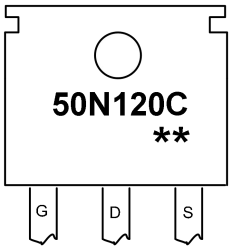


TO-247-3L

Circuit diagram



Marking



50N120C **=Device Code**
****** **=Week Code**

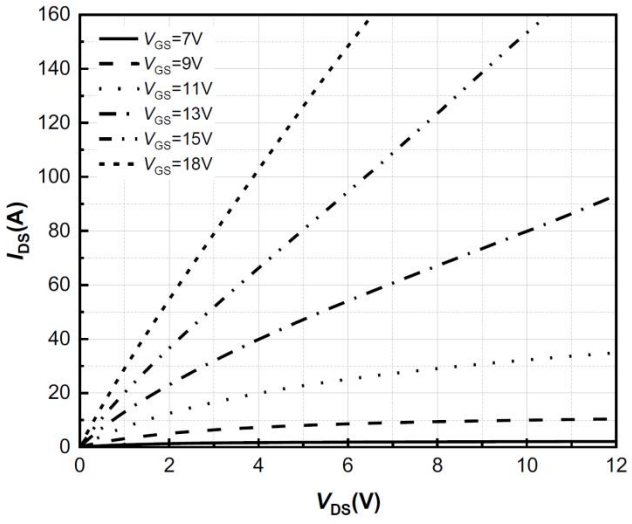
Absolute maximum ratings (Ta=25℃,unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	1200	V
Gate-Source Voltage	V_{GSMAX}	-8/+22	V
Recommend Gate-Source Voltage	V_{GSop}	-4/+18	V
Continuous Drain Current(Tc=25℃)	I_D	74	A
Continuous Drain Current(Tc=100℃)	I_D	50	A
Pulsed Drain Current	I_{DM}	150	A
Total Power Dissipation[2](Tc=25℃)	P_D	312	W
Total Power Dissipation[2](Tc=100℃)	P_D	156	W
Thermal Resistance Junction-Case	$R_{\theta JC}$	0.51	℃/W
Storage Temperature Range	T_{STG}	-40 to 175	℃
Operating Junction Temperature Range	T_J	-40 to 175	℃

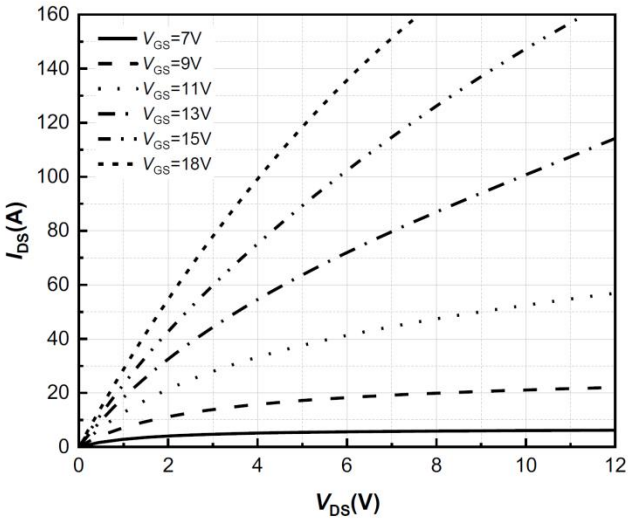
Electrical characteristics (Ta=25℃, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	VGS=0V , ID=250uA	1200	---	---	V
Drain-Source Leakage Current	I_{DSS}	VDS=1200V , VGS=0V , TJ=25℃	---	1	---	uA
Gate-Source Leakage Current	I_{GSS}	VGS=18V , VDS=0V	---	---	250	nA
Gate Threshold Voltage	$V_{GS(th)}$	VGS=VDS , ID =5mA, T_j=25℃	2	2.5	4	V
		VGS=VDS , ID =5mA, T_j=100℃	---	1.8	---	
Static Drain-Source On-Resistance	$R_{DS(ON)}$	VGS=18V , ID=20A, T_j=25℃	---	35	45	mΩ
		VGS=18V , ID=20A, T_j=150℃	---	69	---	
Dynamic characteristics						
Input Capacitance	C_{iss}	VDS=1000V , VGS=0V , f=1MHz	---	2975	---	pF
Output Capacitance	C_{oss}		---	119	---	
Reverse Transfer Capacitance	C_{rss}		---	12	---	
Switching Characteristics						
Total Gate Charge (4.5V)	Q_g	VDS=800V , VGS=-4/+18V , ID=40A	---	117	---	nC
Gate-Source Charge	Q_{gs}		---	38	---	
Gate-Drain Charge	Q_{gd}		---	27	---	
Turn-On Delay Time	$T_{d(on)}$	VDS=800V , VGS=-4/+18V , ID=40A RG=2.5Ω	---	18	---	ns
Rise Time	T_r		---	21	---	ns
Turn-Off Delay Time	$T_{d(off)}$		---	31	---	ns
Fall Time	T_f		---	9	---	ns
Turn-On Energy	E_{on}		---	485	---	nJ
Turn-Off Energy	E_{off}		---	75	---	nJ
Reverse Diode Characteristics						
Diode Forward Voltage	V_{SD}	VGS=-4V , I_{SD}=20A , T_J=25℃	---	5	---	V
		VGS=-4V , I_{SD}=20A , T_J=175℃	---	4.4	---	
Continuous Diode Forward Current	I_S	VGS=-4V, Tc=25°C	---	45	---	A
		VGS=-4V, Tc=100°C	---	25	---	
Reverse Recovery Time	trr	VGS=-4V, I_{SD}=20A, V_R=800V, di/dt=3900A/μs	---	19	---	ns
Reverse Recovery Charge	Qrr		---	500	---	nC
Peak Reverse Recovery Current	Irrm		---	50	---	A

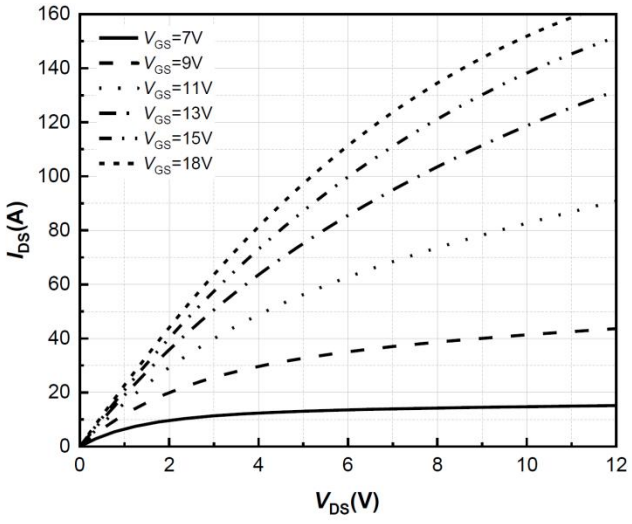
Typical Characteristics



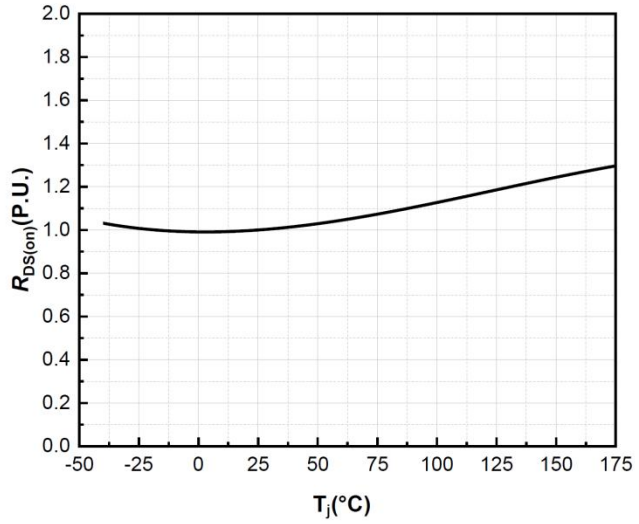
Output Characteristics T_j=-40°C



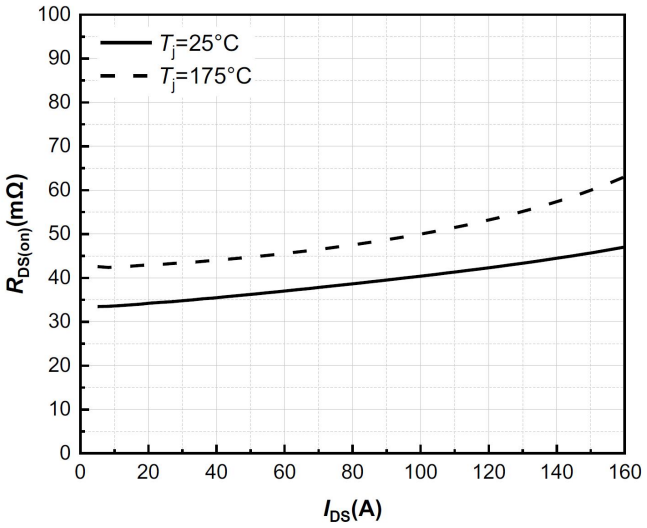
Output Characteristics T_j=25°C



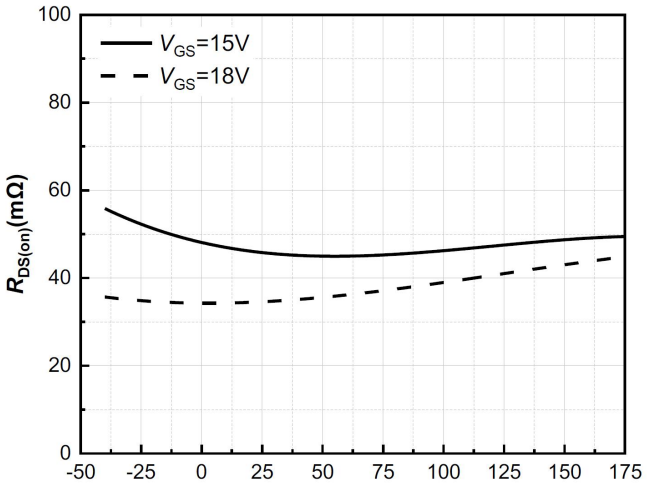
Output Characteristics T_j=175°C



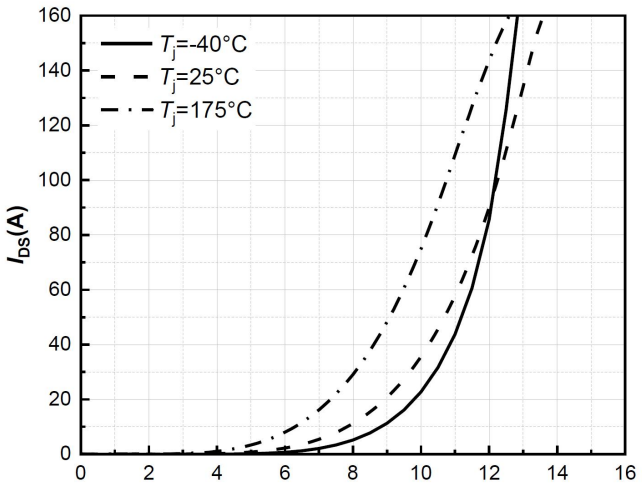
Normalized On-Resistance vs. Temperature



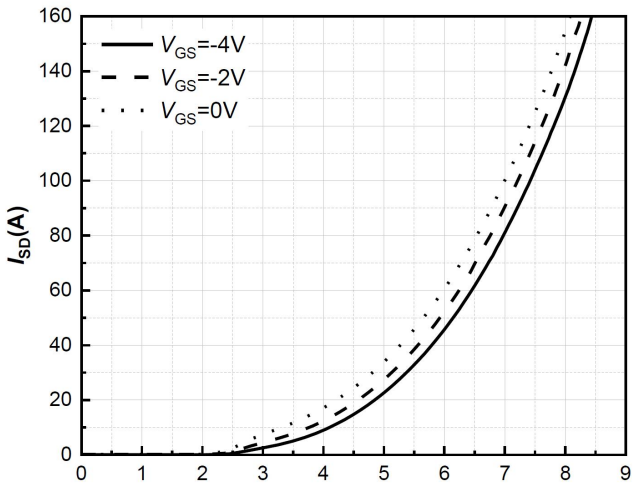
On-Resistance vs. Drain Current For Various Temperatures



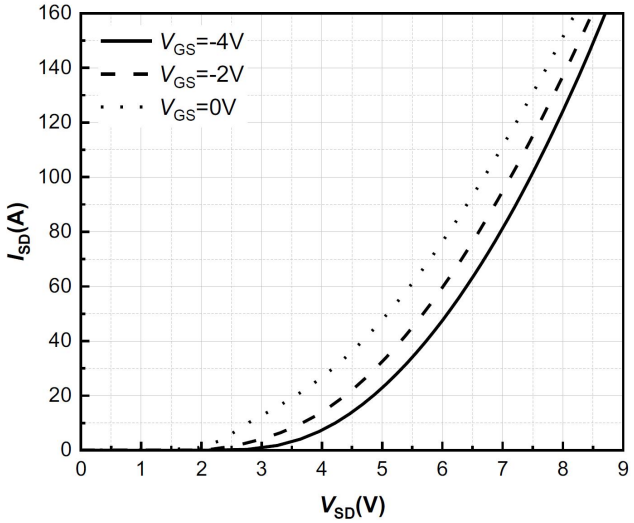
On-Resistance vs. Temperature For Various Gate Voltage



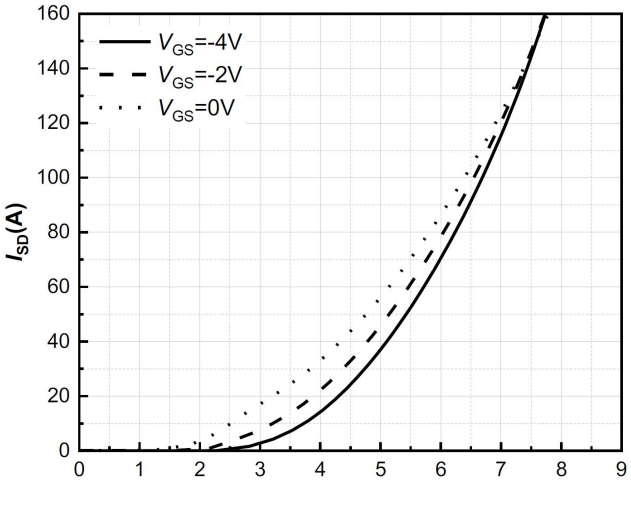
Transfer Characteristic for Various Junction Temperatures V_{DS}=20V



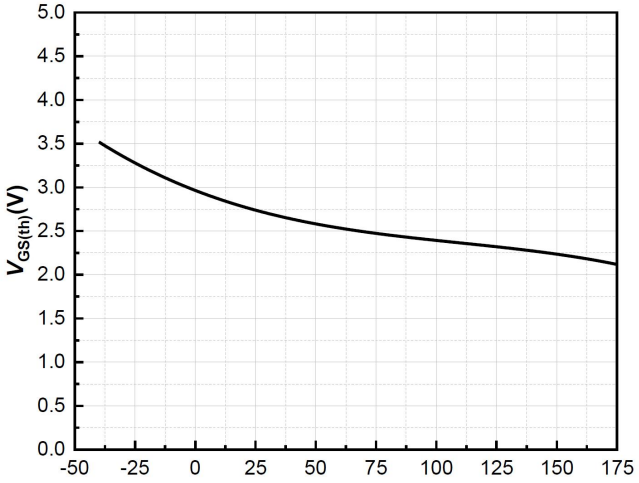
Body Diode Characteristic T_j=-40°C



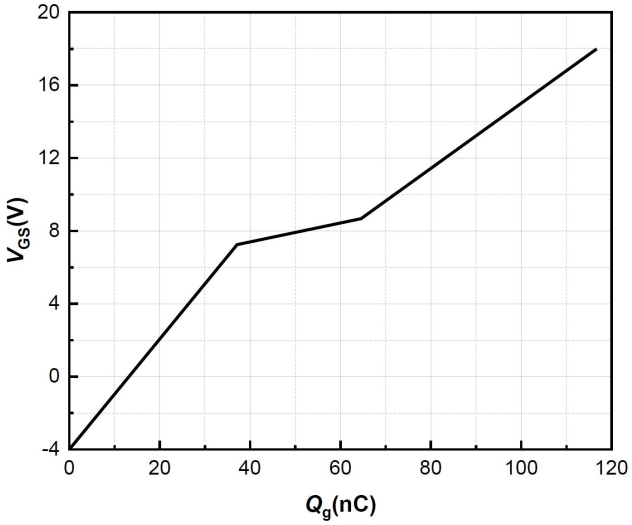
Body Diode Characteristic T_j=25°C



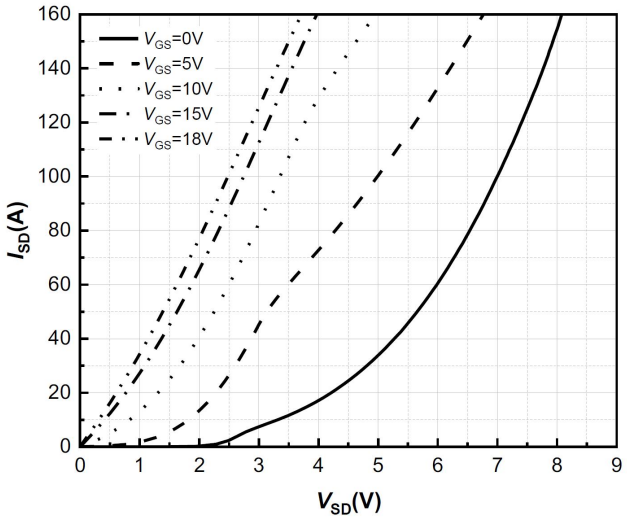
Body Diode Characteristic T_j=175°C



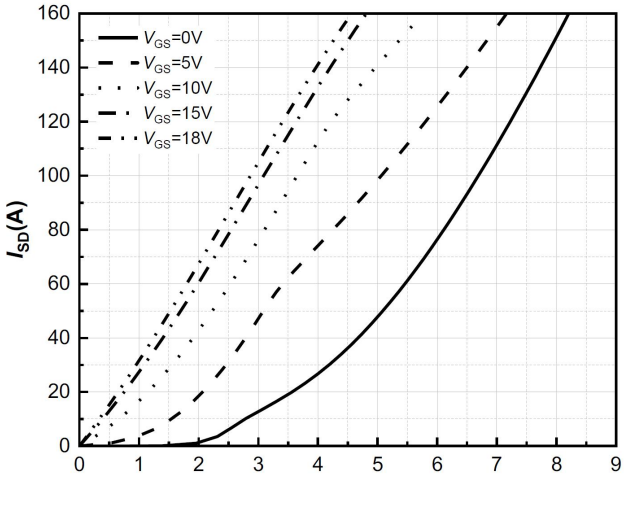
Threshold Voltage vs. Temperature



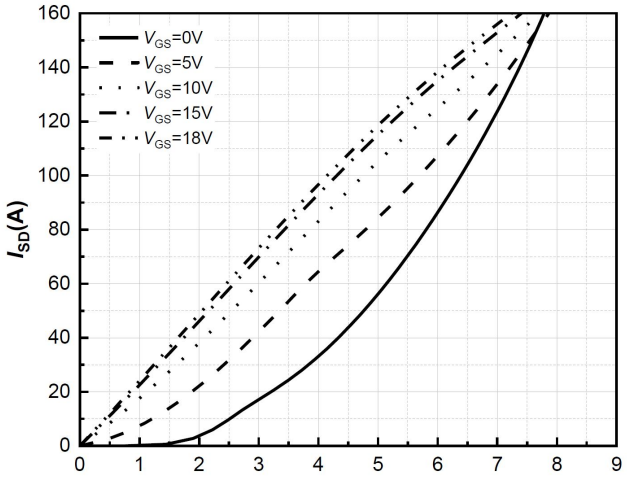
Gate Charge Characteristics



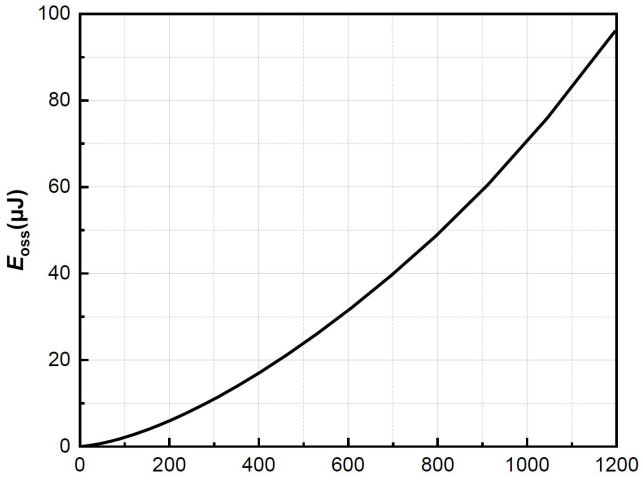
3rd Quadrant Characteristic T_j=-40°C



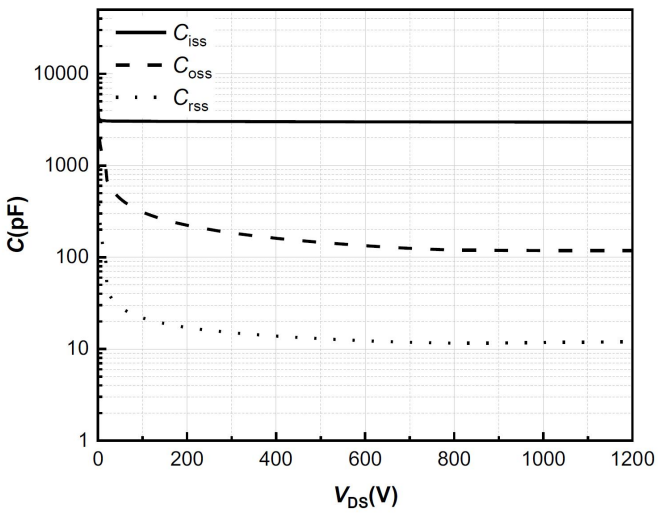
3rd Quadrant Characteristic T_j=25°C



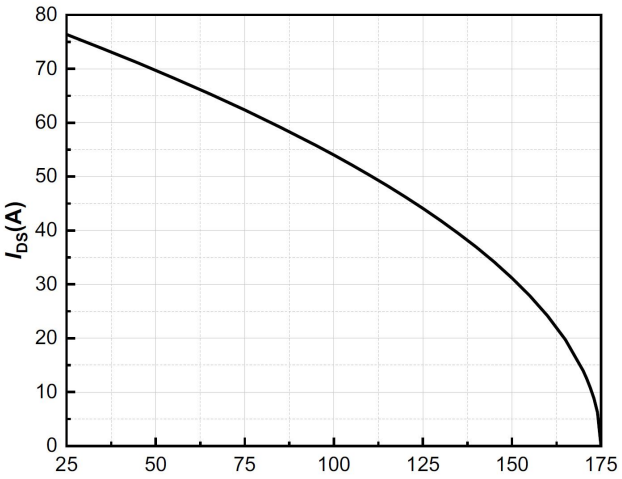
3rd Quadrant Characteristic T_j=175°C



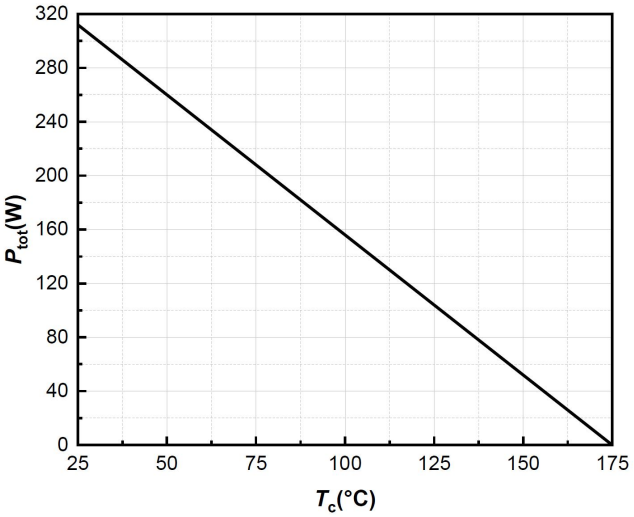
Output Capacitor Stored Energy



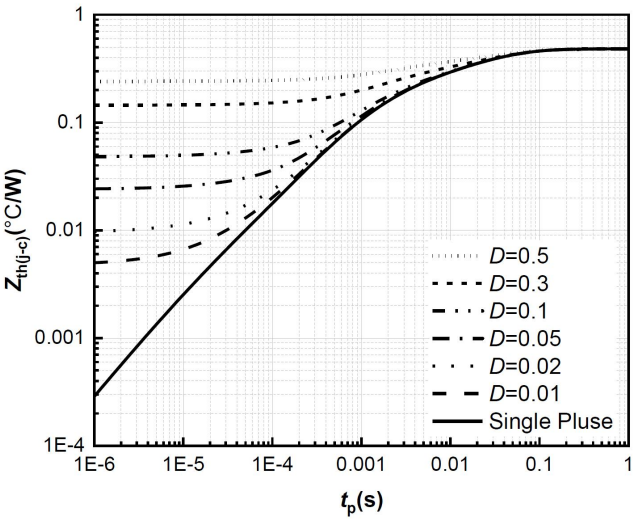
Capacitances vs. Drain-Source



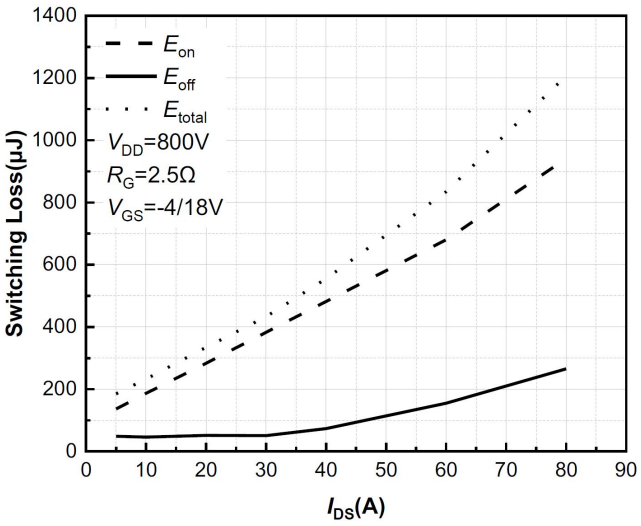
Continuous Drain Current Derating vs. Case Temperature



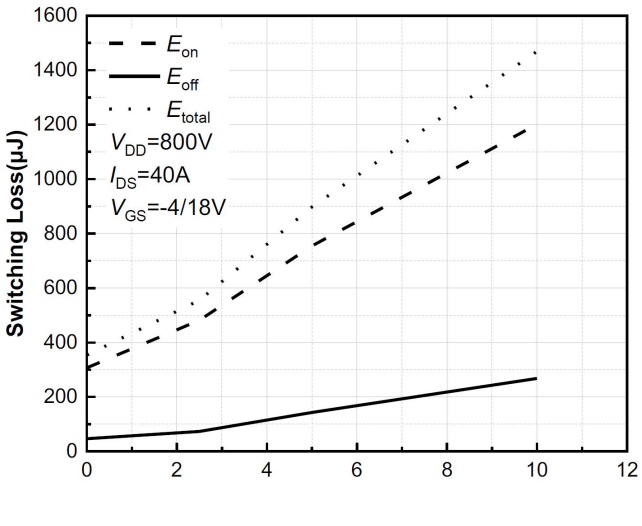
Maximum Power Dissipation Derating vs. Case Temperature



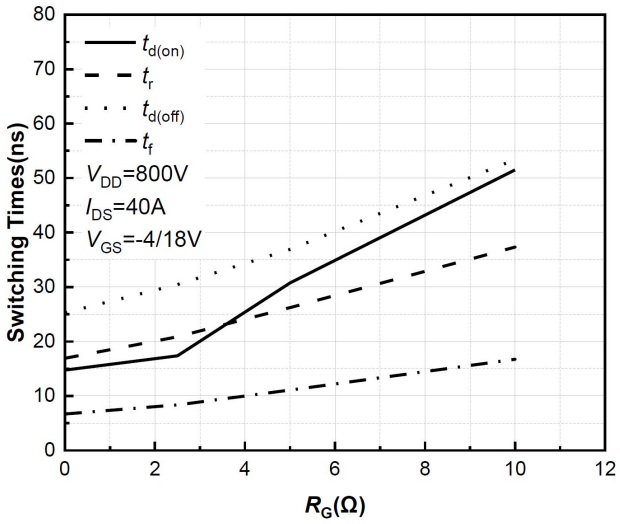
Transient Thermal Impedance



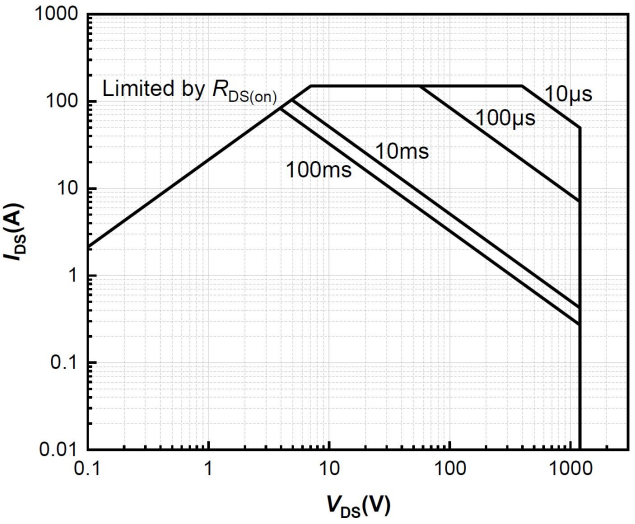
Clamped Inductive Switching Energy vs. Drain Current



Clamped Inductive Switching Energy vs. R_G

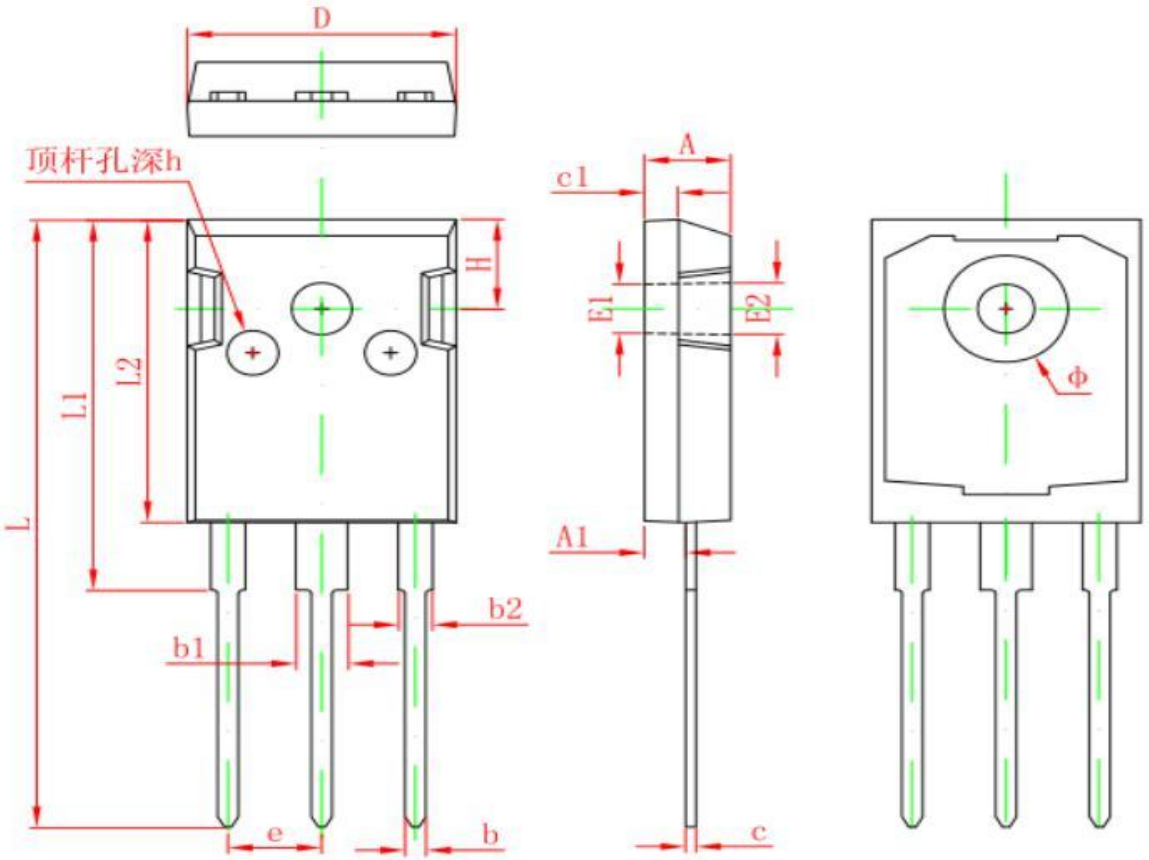


Switching Times vs. R_G



Safe Operating Area

TO-247-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF.		0.138 REF.	
E2	3.600 REF.		0.142 REF.	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
Φ	7.100	7.300	0.280	0.287
e	5.450 TYP.		0.215 TYP.	
H	5.980 REF.		0.235 REF.	
h	0.000	0.300	0.000	0.012

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