

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
1200V	60mΩ@18V	25A

Feature

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

Applications

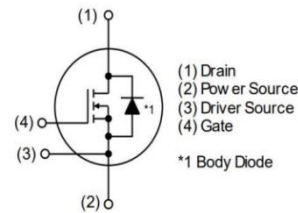
- Power Factor Correction Modules
- Switch Mode Power Supplies
- DC-AC Inverters
- High Voltage DC/DC Converterst

Package

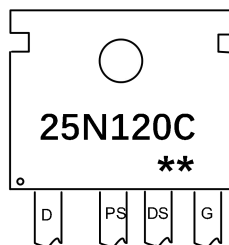


TO-247-4L

Circuit diagram



Marking



25N120C
**

=Device Code
=Week Code



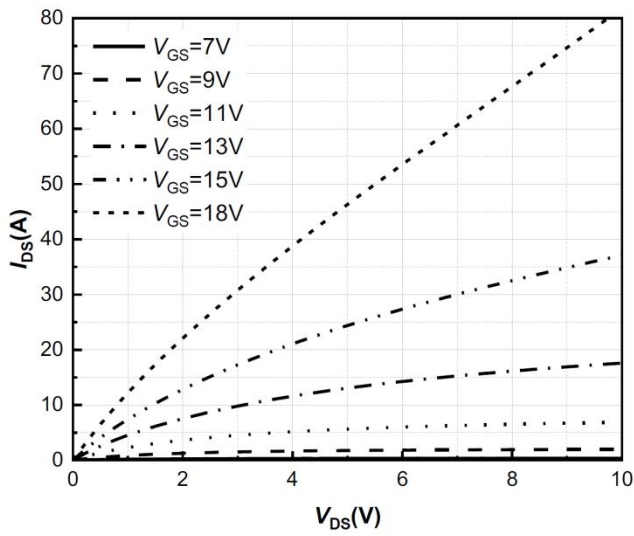
Absolute maximum ratings (Ta=25°C, unless otherwise noted)

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°C)	I _D	52	A
Continuous Drain Current(Tc=100°C)	I _D	25	A
Pulsed Drain Current	I _{DM}	80	A
Total Power Dissipation ² (Tc=25°C)	P _D	171	W
Total Power Dissipation ² (Tc=100°C)	P _D	68	W
Thermal Resistance Junction-Case	R _{θJC}	0.73	°C/W
Storage Temperature Range	T _{STG}	-40 to 150	°C
Operating Junction Temperature Range	T _J	-40 to 150	°C

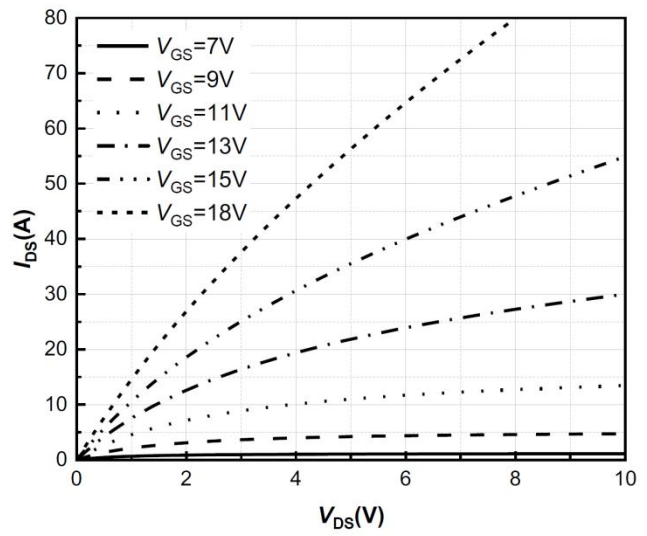
Electrical characteristics (Ta=25°C, unless otherwise noted)

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 , T _J =25°C	---	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°C	2	2.5	4	V
		VGS=VDS , ID =5mA, T _J =100°C	---	1.8	---	
Static Drain-Source On-Resistance	R _{DS(ON)}	VGS=18V , ID=20A, T _J =25°C	---	60	75	mΩ
		VGS=18V , ID=20A, T _J =150°C	---	90	---	
Dynamic characteristics						
Input Capacitance	C _{iss}	VDS=1000V , VGS=0V , f=1MHz	---	1920	---	pF
Output Capacitance	C _{oss}		---	80	---	
Reverse Transfer Capacitance	C _{rss}		---	5	---	
Switching Characteristics						
Total Gate Charge (4.5V)	Q _g	VDS=800V , VGS=-4/+18V , ID=20A	---	87	---	nC
Gate-Source Charge	Q _{gs}		---	29	---	
Gate-Drain Charge	Q _{gd}		---	31	---	
Rise Time	T _r		---	75	---	
Turn-Off Delay Time	T _{d(off)}		---	89	---	
Fall Time	T _f		---	29	---	
Reverse Diode Characteristics						
Diode Forward Voltage	V _{SD}	VGS=-4V , I _{SD} =20A , T _J =25°C	---	4.5	---	V
		VGS=-4V , I _{SD} =20A , T _J =150°C	---	4	---	
Continuous Diode Forward Current	I _S	VGS=-4V , Tc=25°C	---	43	---	A
		VGS=-4V , Tc=100°C	---	24	---	
Reverse Recovery Time	t _{rr}	VGS=-4V , I _{SD} =20A, V _R =800V, di/dt=3700A/μs	---	32	---	ns
Reverse Recovery Charge	Q _{rr}		---	265	---	nC
Peak Reverse Recovery Current	I _{rrm}		---	16	---	A

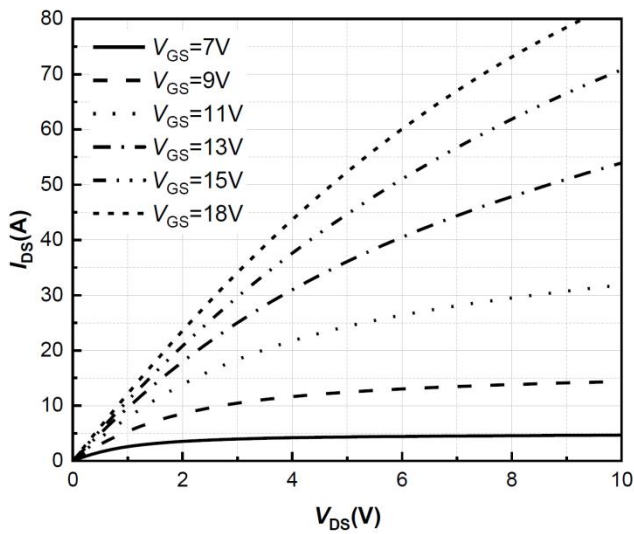
Typical Characteristics



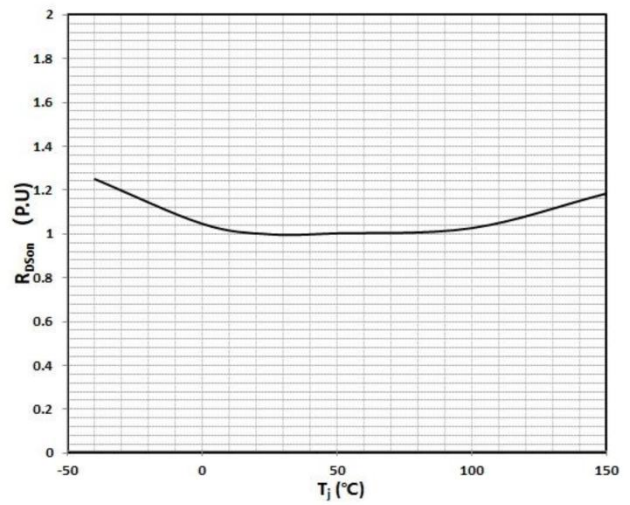
Output Characteristics $T_j = -40^\circ\text{C}$



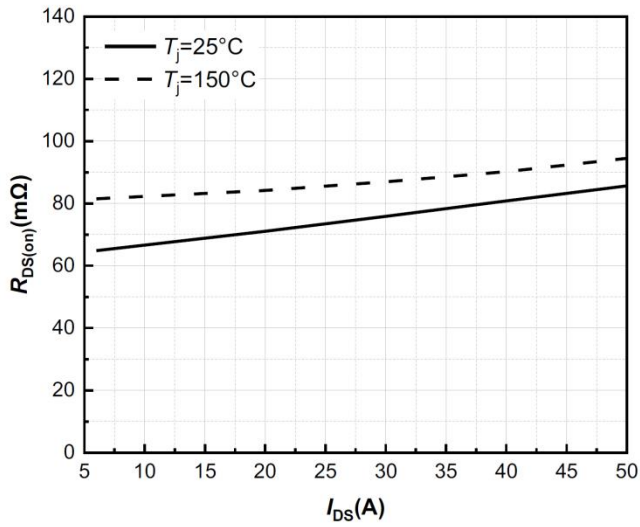
Output Characteristics $T_j = 25^\circ\text{C}$



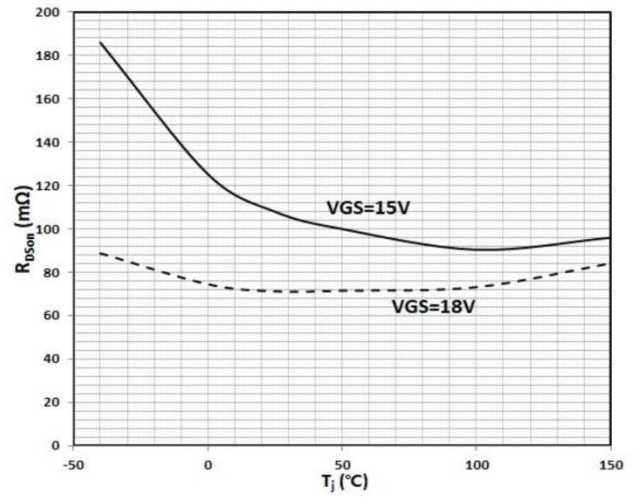
Output Characteristics $T_j = 150^\circ\text{C}$



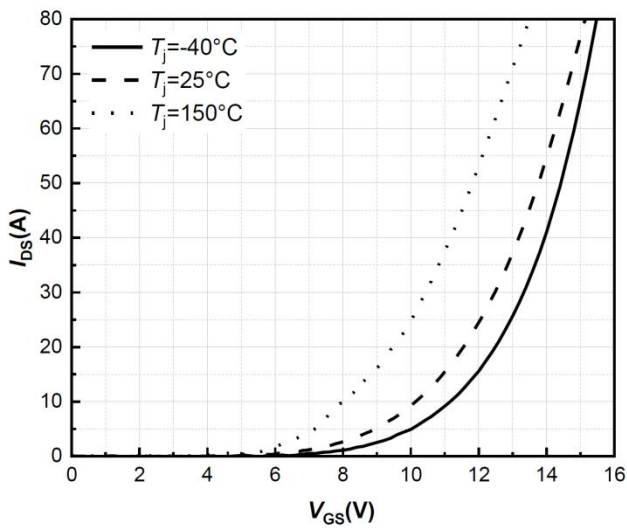
Normalized On-Resistance vs. Temperature



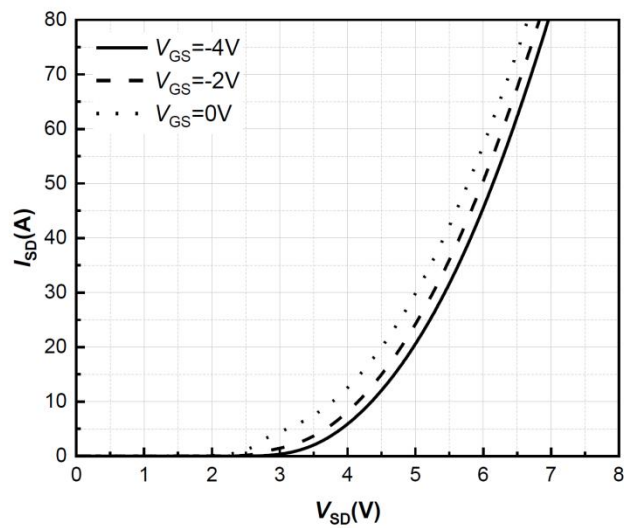
On-Resistance vs. Drain Current For Various Temperatures



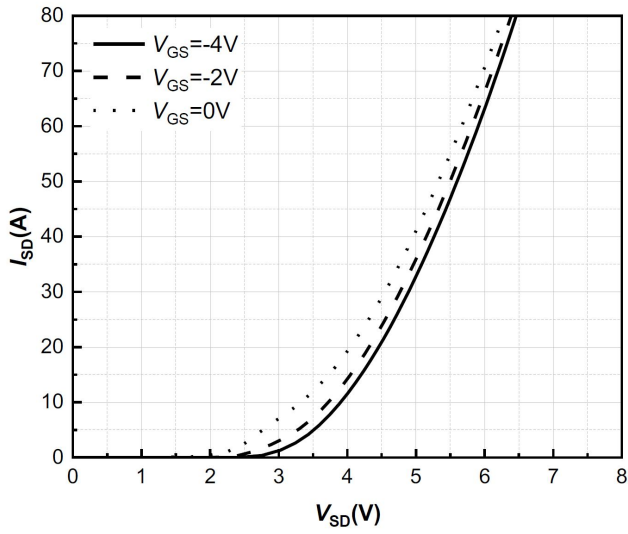
On-Resistance vs. Temperature For Various Gate Voltage



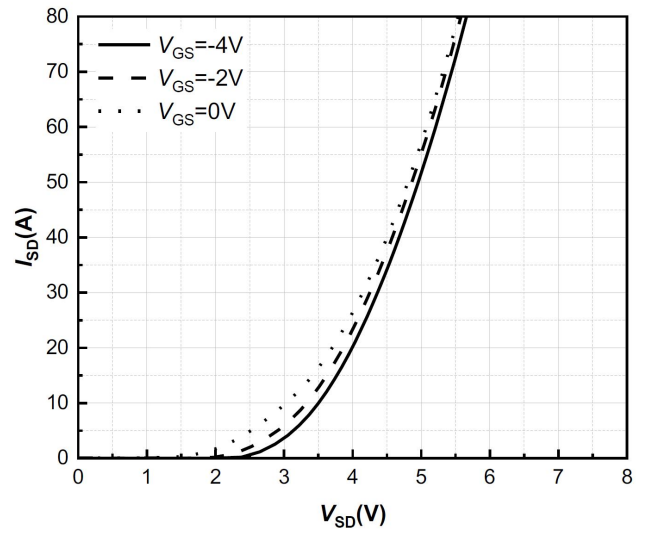
Transfer Characteristic for Various Junction Temperature $V_{GS}=20V$



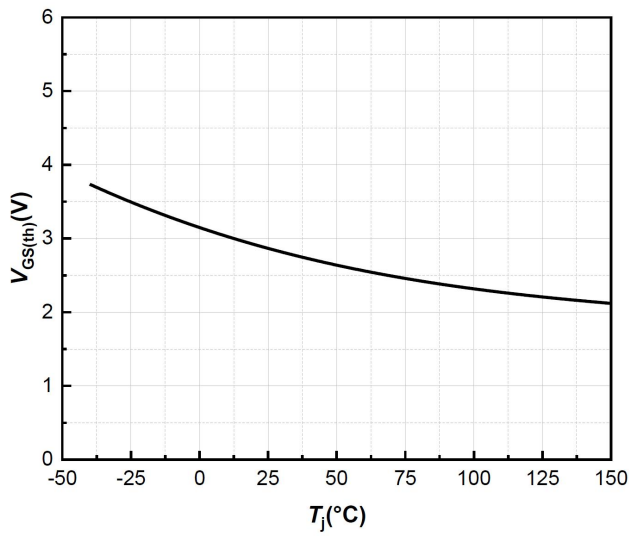
Body Diode Characteristic $T_j=-40^\circ C$



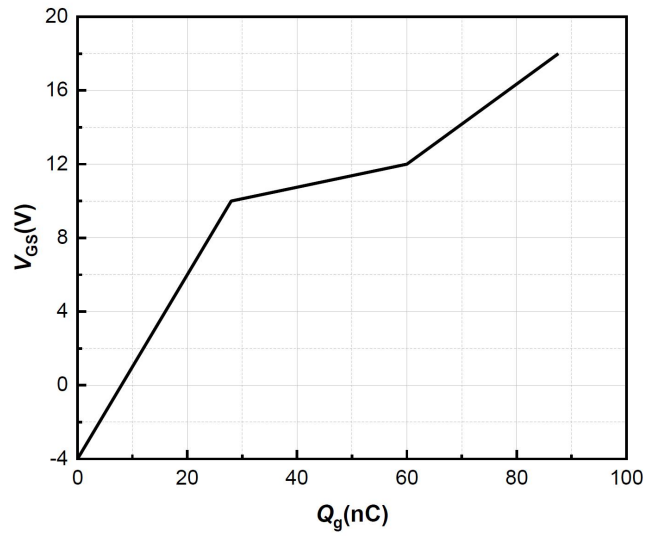
Body Diode Characteristic $T_j=25^{\circ}\text{C}$



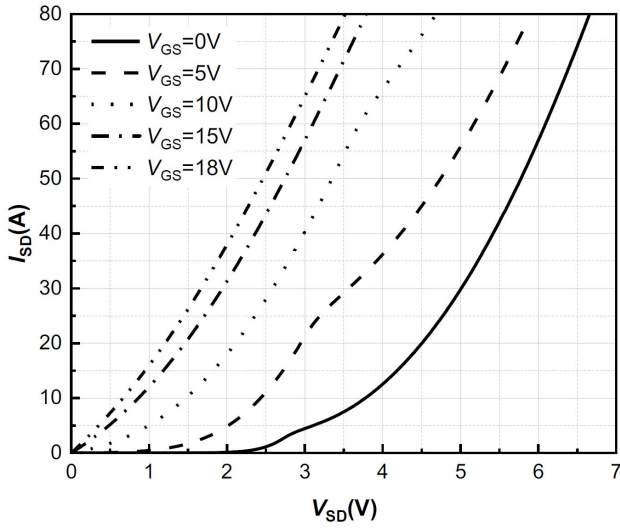
Body Diode Characteristic $T_j=150^{\circ}\text{C}$



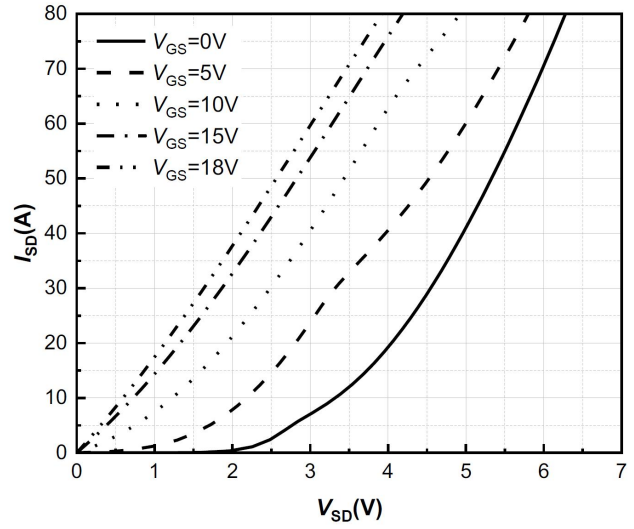
Threshold Voltage vs. Temperature



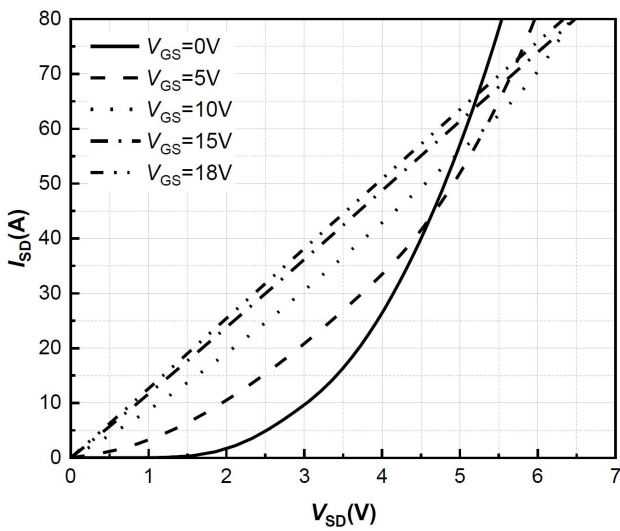
Gate Charge Characteristics



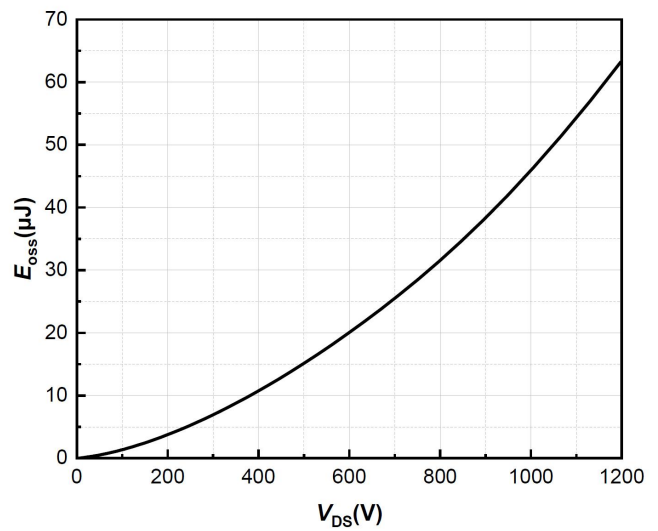
3rd Quadrant Characteristic $T_j = -40^\circ\text{C}$



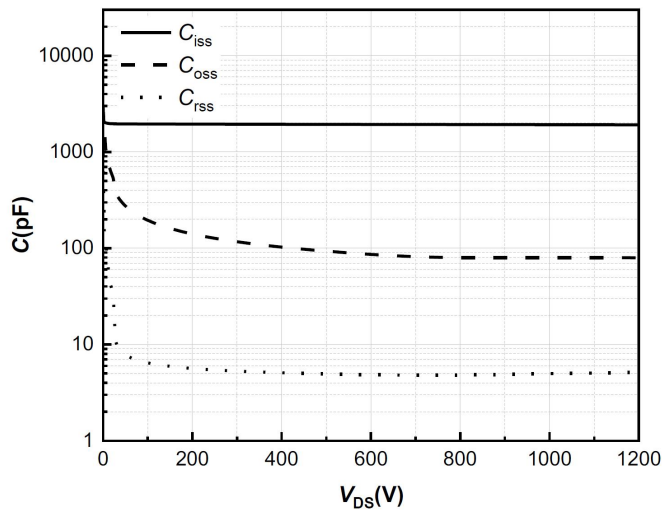
3rd Quadrant Characteristic $T_j = 25^\circ\text{C}$



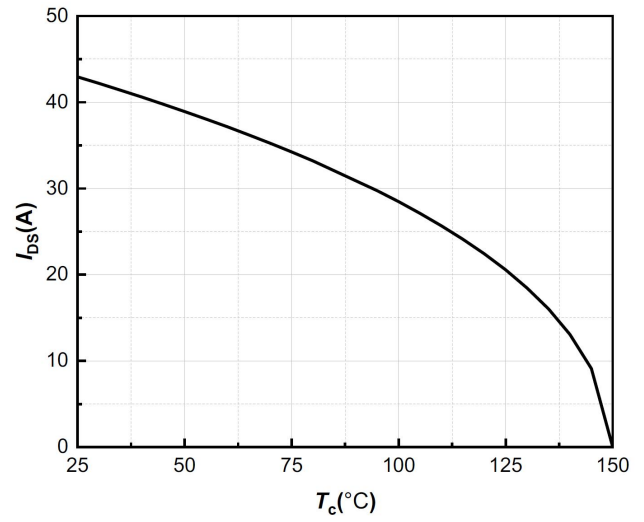
3rd Quadrant Characteristic $T_j = 150^\circ\text{C}$



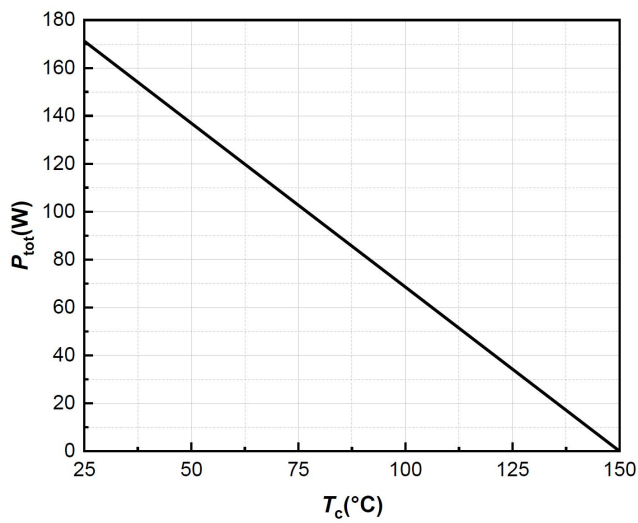
Output Capacitor Stored Energy



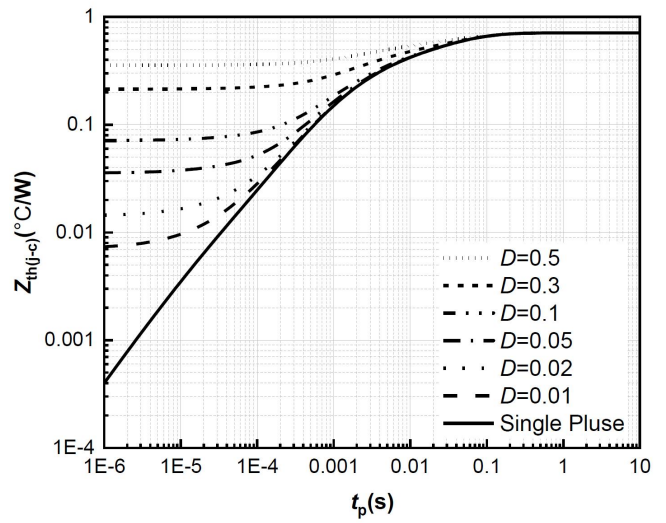
Capacitances vs. Drain-Source



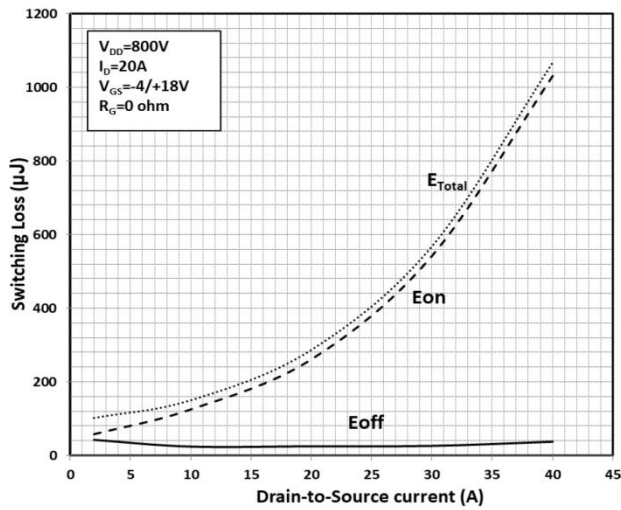
Continuous Drain Current Derating vs. Case Temperature



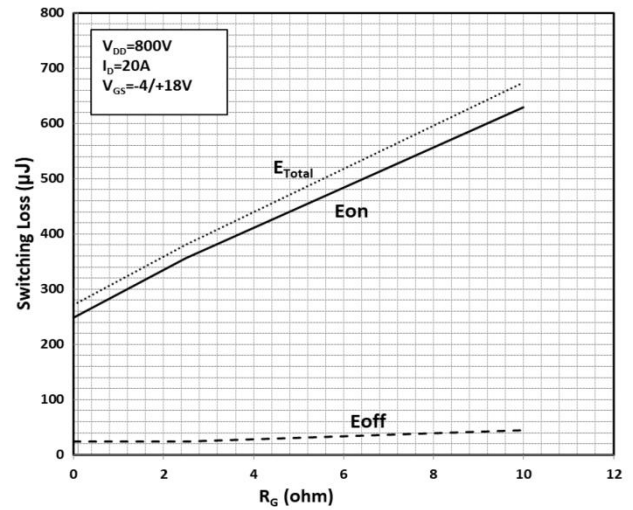
Maximum Power Dissipation Derating vs. Case Temperature



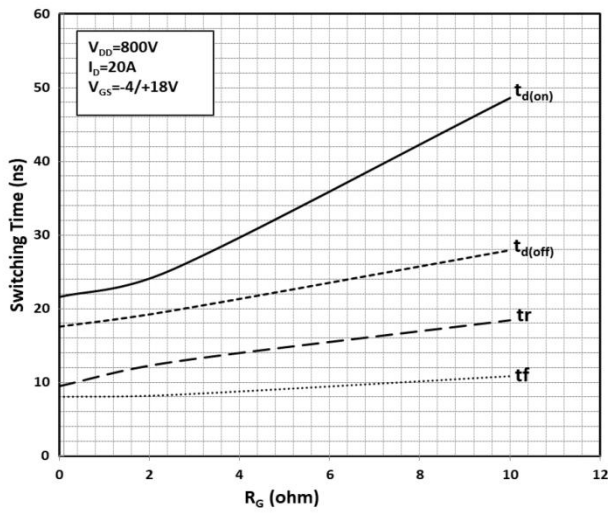
Transient Thermal Impedance



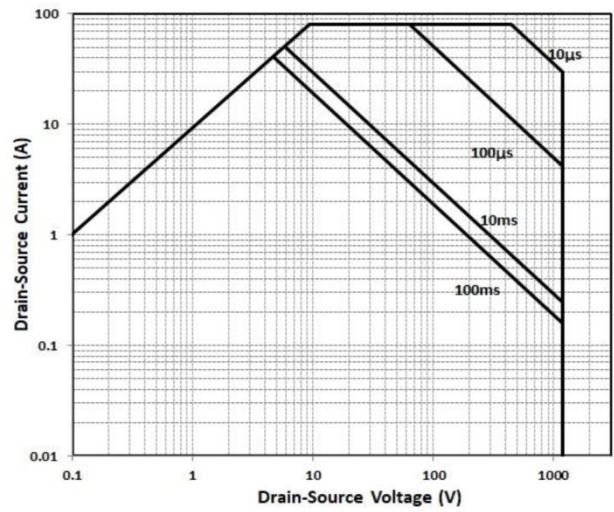
Clamped Inductive Switching Energy vs. Drain Current



Clamped Inductive Switching Energy vs. R_G



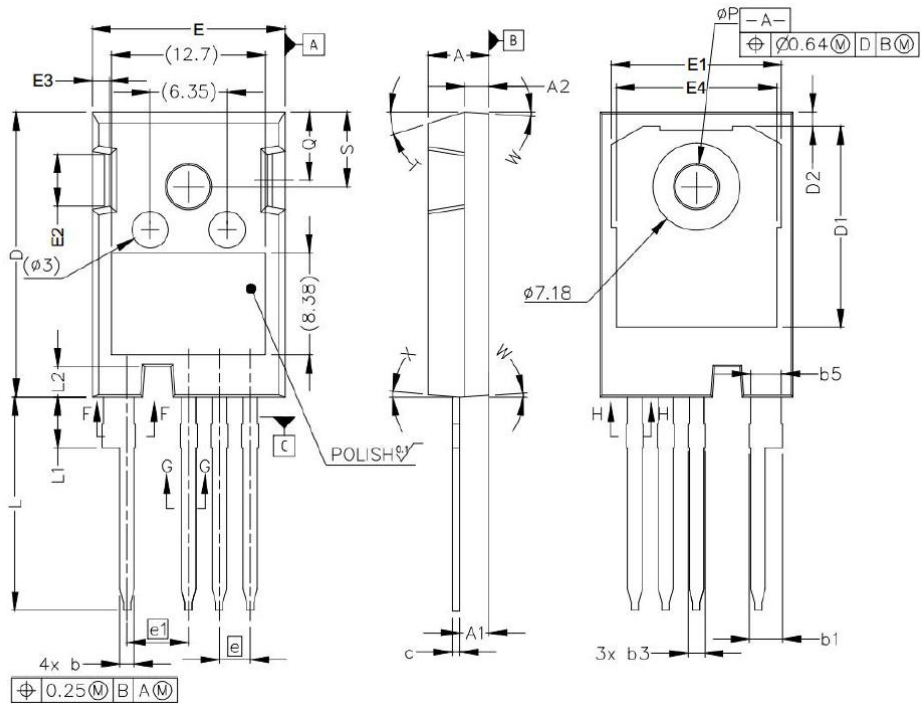
Switching Times vs. R_G



Safe Operating Area



TO-247-4L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	0.19	0.21
A1	2.29	2.54	0.09	0.10
A2	1.91	2.16	0.08	0.09
b1	2.39	2.94	0.09	0.12
b3	1.07	1.60	0.04	0.06
b5	2.39	2.69	0.09	0.11
c	0.55	0.68	0.02	0.03
D	23.30	23.60	0.92	0.93
D1	16.25	17.65	0.64	0.69
D2	0.95	1.25	0.04	0.05
E	15.75	16.13	0.62	0.64
E1	13.10	14.15	0.52	0.56
E2	3.68	5.10	0.14	0.20
E3	1.00	1.90	0.04	0.07
E4	12.38	13.43	0.49	0.53
e	2.54 BSC		0.1 BSC	
e1	5.08 BSC		0.2 BSC	
L	17.31	17.82	0.68	0.70
L1	3.97	4.37	0.16	0.17
L2	2.35	2.65	0.09	0.10
ϕP	3.51	3.65	0.14	0.14
Q	5.49	6.00	0.22	0.24
S	6.04	6.30	0.24	0.25
T	17.5° REF.		0.69° REF.	
W	3.5° REF.		0.14° REF.	
X	4.0° REF.		0.16° REF.	

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