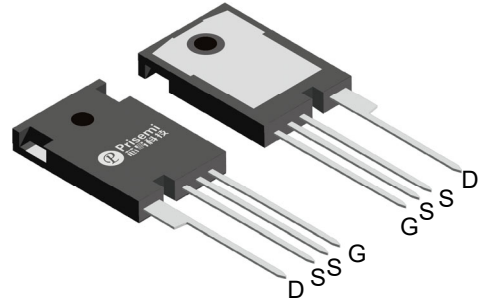


Description

MOSFET Product Summary

$V_{DS}(V)$	$R_{DS(on)}(m\Omega)$	$I_D(A)$
1200	40	69



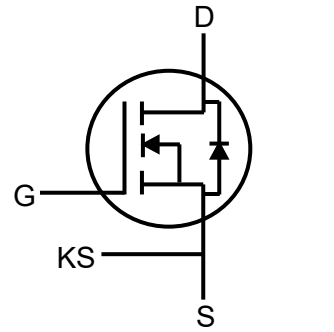
Feature

- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low $R_{DS(on)}$
- Avalanche Ruggednes

Applications

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC-DC Converters
- Battery Chargers

TO-247-4L (Top View)



Schematic diagram

Absolute maximum rating@25°C

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	1200	V
Gate-Source Voltage (Absolute maximum values)		V_{GSmax}	-10/+23	V
Gate-Source Voltage (Recommended operational values)		V_{GSop}	-5/+18	V
Continuous Drain Current	$T_C=25^\circ C$	I_D	69	A
	$T_C=100^\circ C$		49	
Pulsed drain current ($T_C = 25^\circ C$, tp limited by T_{jmax})		$I_{D\ pulse}$	189	A
Power dissipation		P_D	313	W
Operating Junction and Storage Temperature		T_J, T_{STG}	-55 to +175	°C
Solder Temperature, 1.6mm from case for 10s		T_L	260	°C

Thermal Resistance

Parameter	Symbol	Min	Typ	Max	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	-	0.48	-	°C/W

Electrical characteristics per line@25°C (unless otherwise specified)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Units
Statistic Characteristics							
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 100\mu A$		1200	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 9.5\text{ mA}$	$T_j=25^{\circ}C$	2.0	3.0	4.0	V
			$T_j=175^{\circ}C$	-	2.2	-	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}= 1200V, V_{GS} = 0V$		-	1	50	μA
Gate-Body Leakage Current	I_{GSS+}	$V_{GS} = 23V, V_{DS} = 0V$		-	10	100	nA
Gate-Body Leakage Current	I_{GSS-}	$V_{GS} = -10V, V_{DS} = 0V$		-	10	100	nA
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS} = 18V, I_D = 33.3A$	$T_j=25^{\circ}C$	-	40	52	m Ω
			$T_j=175^{\circ}C$	-	60	-	
Transconductance	g_{fs}	$V_{DS} = 20V, I_D=33.3A$	$T_j=25^{\circ}C$	-	24	-	S
			$T_j=175^{\circ}C$	-	23	-	
Dynamic Characteristics							
Input Capacitance	C_{iss}	$V_{DS} = 800V, V_{GS} = 0V, V_{AC} = 25mV, f=100kHz,$		-	1810	-	pF
Output Capacitance	C_{oss}			-	69	-	
Reverse Transfer Capacitance	C_{rss}			-	6.5	-	
C_{oss} Stored Energy	E_{oss}			-	22	-	
Turn-On Energy (Body Diode)	E_{on}	$V_{DS}=800V, I_D=33.3A, V_{GS}=-5/+18V, R_g=2.5\Omega, L=100\mu H$		-	380	-	μJ
Turn-Off Energy (Body Diode)	E_{off}			-	156	-	
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=800V, I_D=33.3A, V_{GS}=-5/+18V, R_g=2.5\Omega, R_L=24\Omega,$		-	18	-	ns
Turn-on Rise Time	t_r			-	14	-	
Turn-Off Delay Time	$t_{d(off)}$			-	25	-	
Turn-Off Fall Time	t_f			-	6	-	
Internal Gate Resistance	$R_{G(int)}$	$V_{AC}=25mV, f=1MHz$		-	2.5	-	Ω
Total Gate Charge	Q_g	$V_{DS}=800V, V_{GS}=-5/+18V, I_D=33.3A$		-	75	-	nC
Gate-Source Charge	Q_{gs}			-	18	-	
Gate-Drain Charge	Q_{gd}			-	13	-	

Electrical characteristics per line@25°C (unless otherwise specified)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Units
Reverse Diode Characteristics							
Body Diode Forward Voltage	V _{SD}	V _{GS} =-5V, I _{SD} =16.5A,	T _J =25°C	-	3.9	-	V
			T _J =175°C	-	3.6	-	
Continuous Diode Forward Current	I _S	T _C =25°C		-	58	-	A
Body Diode Reverse Recovery Time	t _{rr}	V _R =800V, I _{SD} =16.5A,		-	10	-	ns
Body Diode Reverse Recovery Charge	Q _{rr}			-	97	-	nC
Peak Reverse Recovery Current	I _{rrm}			-	6	-	A

Typical Characteristics

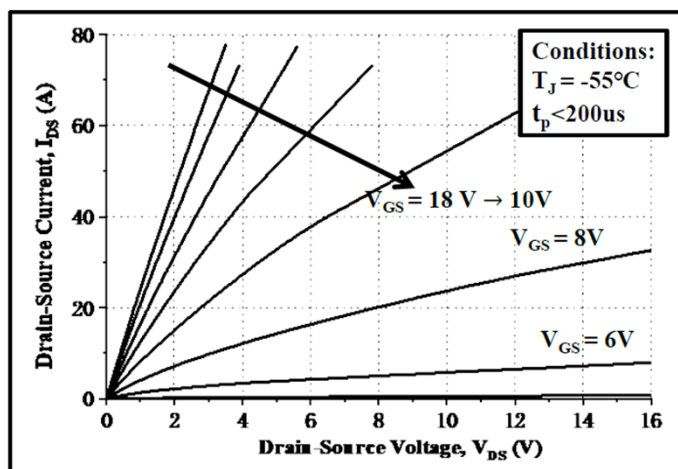
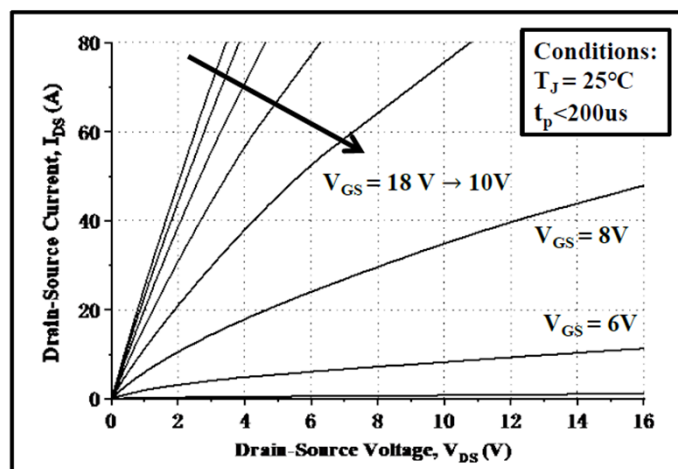
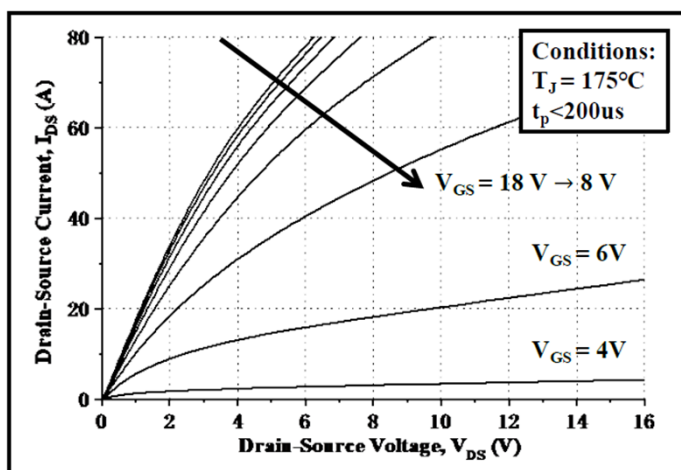
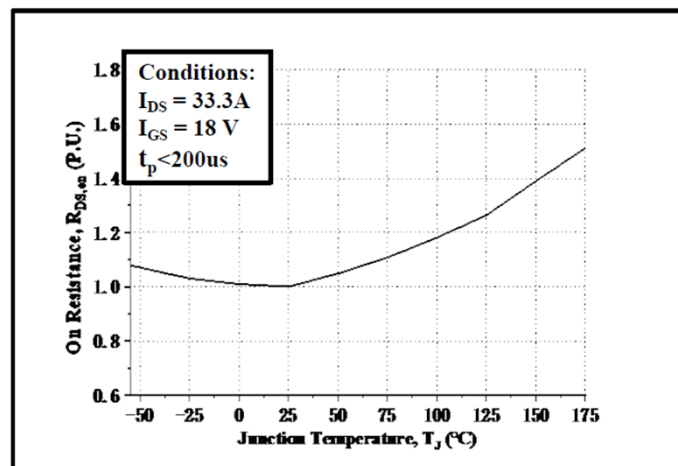
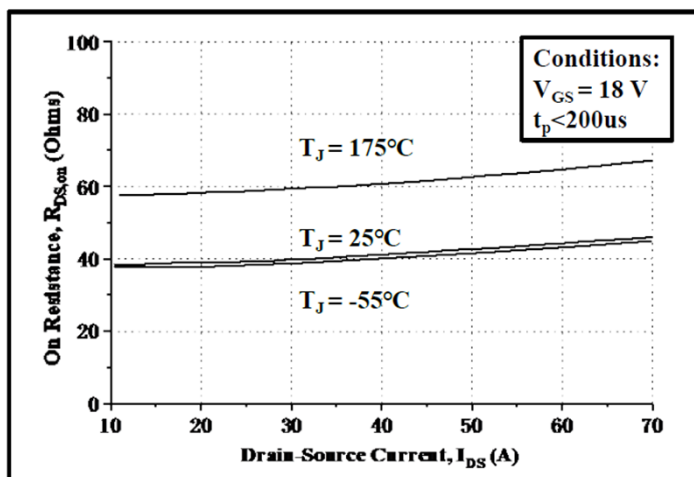
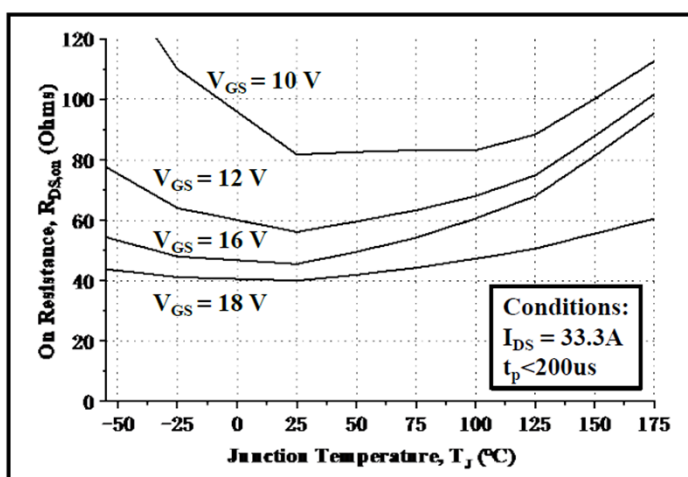
Figure 1. Output Characteristics $T_J = -55^\circ\text{C}$ Figure 2. Output Characteristics $T_J = 25^\circ\text{C}$ Figure 3. Output Characteristics $T_J = 175^\circ\text{C}$ 

Figure 4. Normalized On-Resistance vs. Temperature

Figure 5. On-Resistance vs. Drain Current
For Various TemperaturesFigure 6. On-Resistance vs. Temperature
For Various Gate Voltage

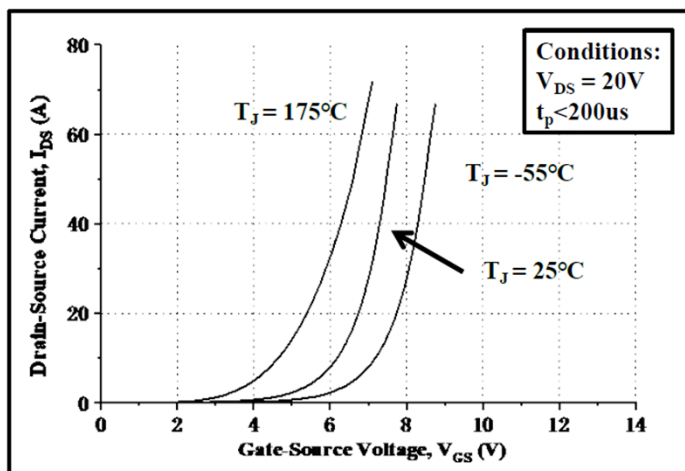


Figure 7. Transfer Characteristic for Various Junction Temperatures

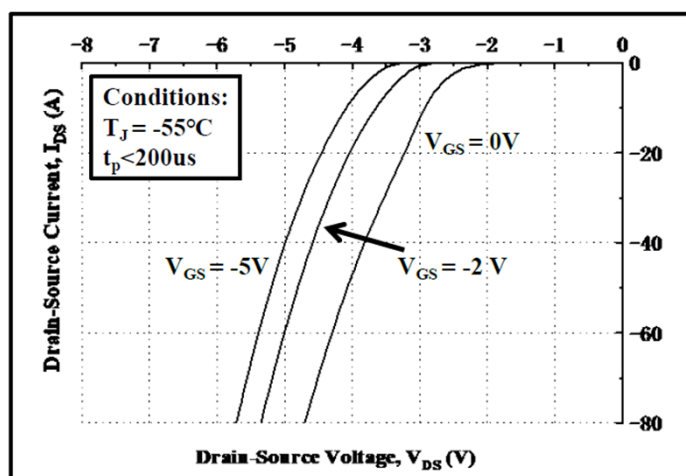


Figure 8. Body Diode Characteristic at -55°C

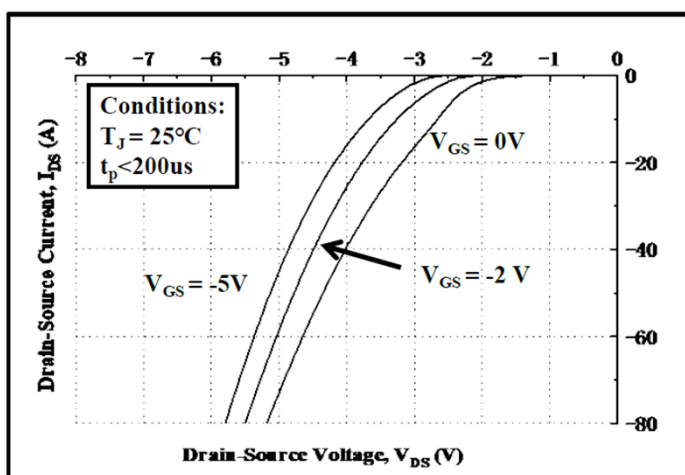


Figure 9. Body Diode Characteristic at 25°C

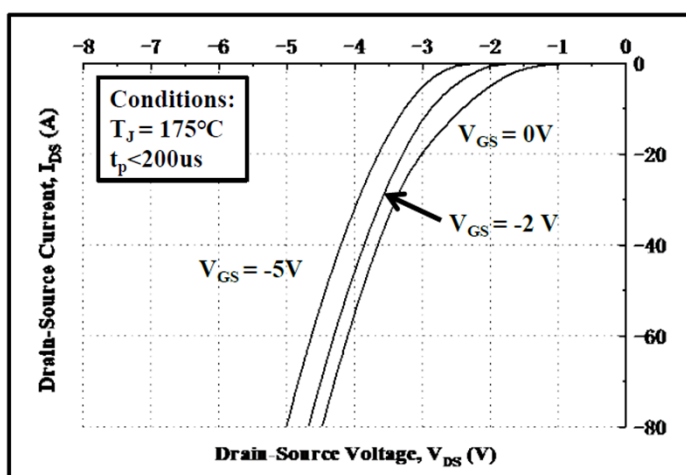


Figure 10. Body Diode Characteristic at 175°C

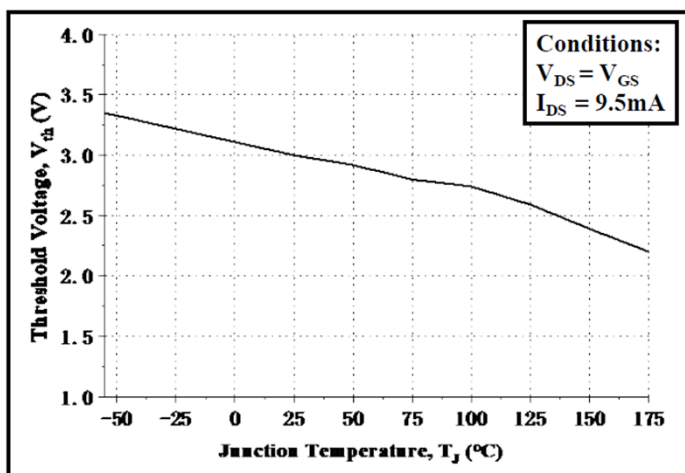


Figure 11. Threshold Voltage vs. Temperature

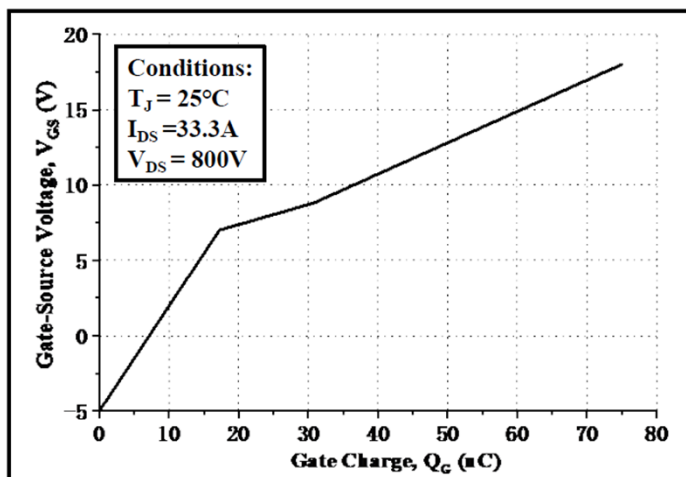


Figure 12. Gate Charge Characteristics

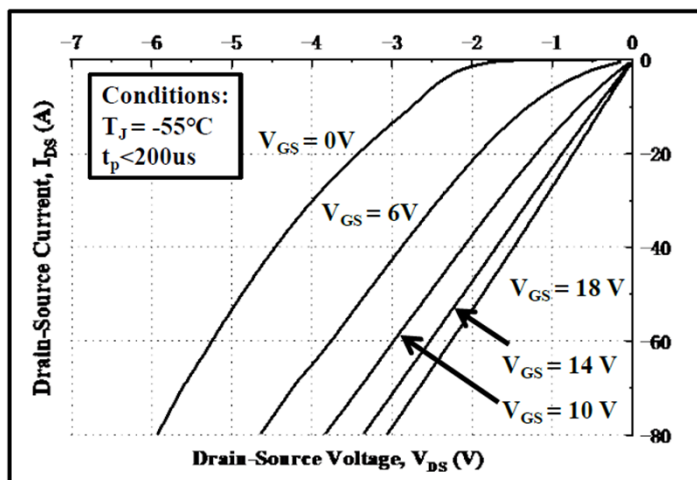
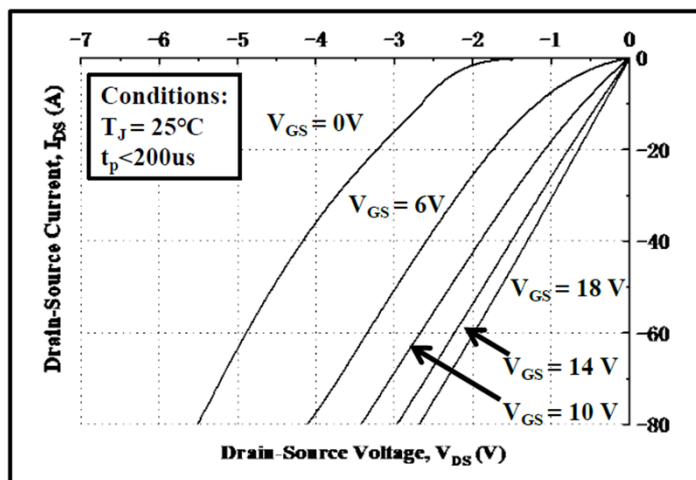
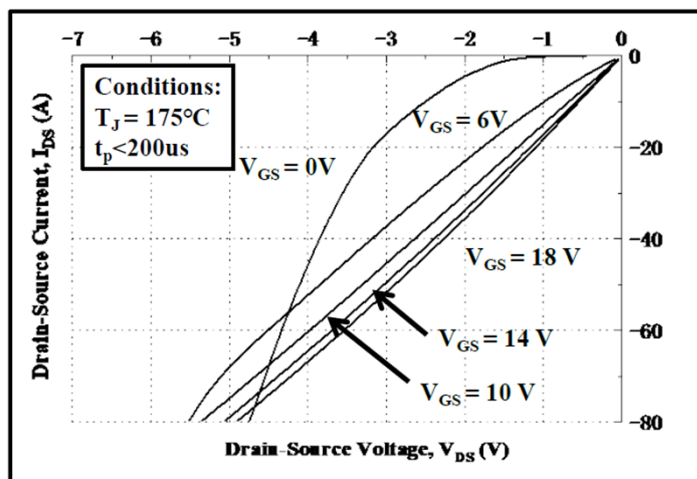
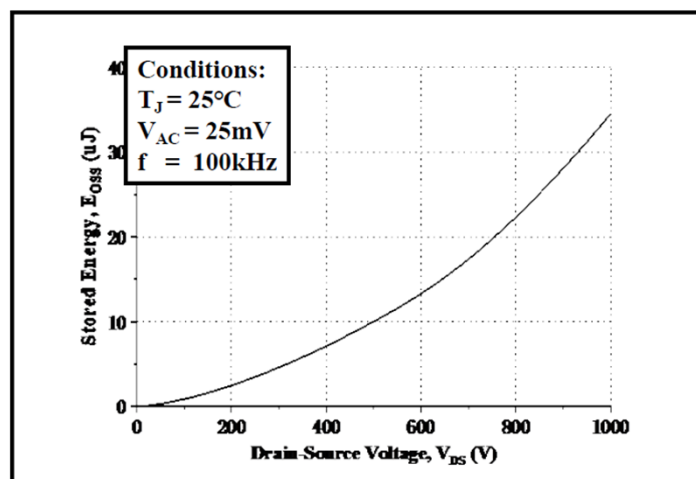
Figure 13. 3rd Quadrant Characteristic at -55°C Figure 14. 3rd Quadrant Characteristic at 25°C Figure 15. 3rd Quadrant Characteristic at 175°C 

Figure 16. Output Capacitor Stored Energy

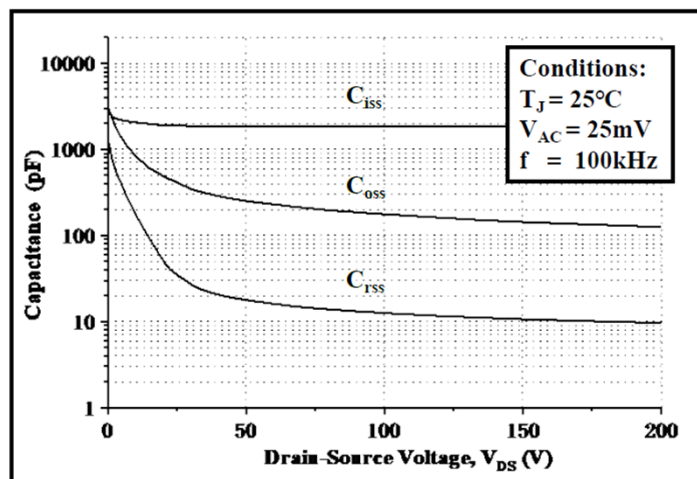


Figure 17. Capacitances vs. Drain-Source Voltage (0 - 200V)

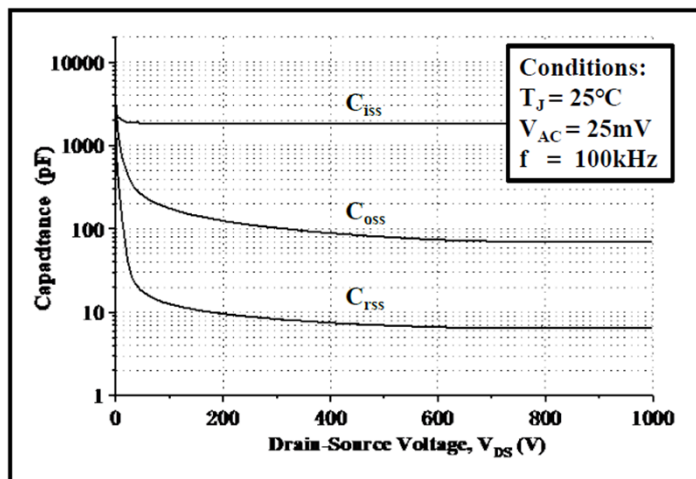


Figure 18. Capacitances vs. Drain-Source Voltage (0 - 1000V)

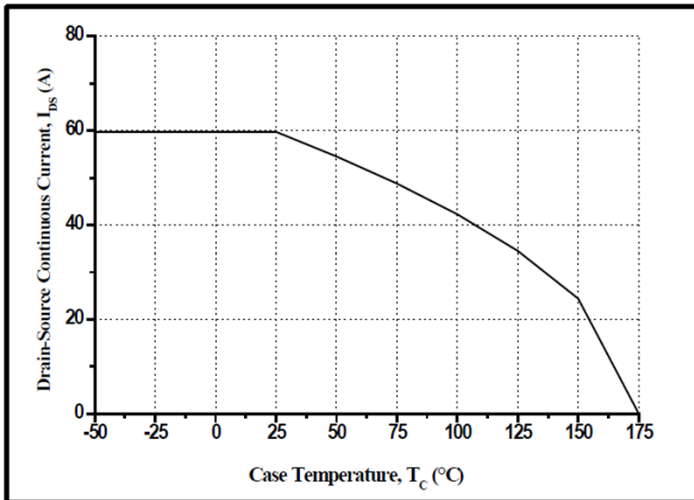


Figure 19. Continuous Drain Current vs. Case Temperature

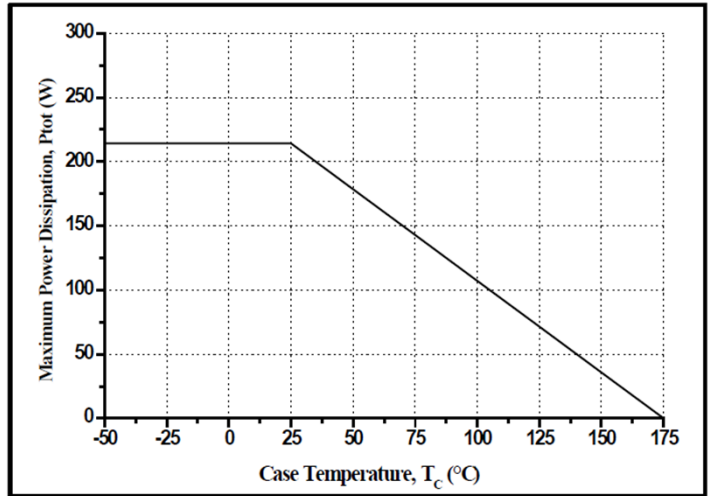


Figure 20. Maximum Power Dissipation vs. Case Temperature

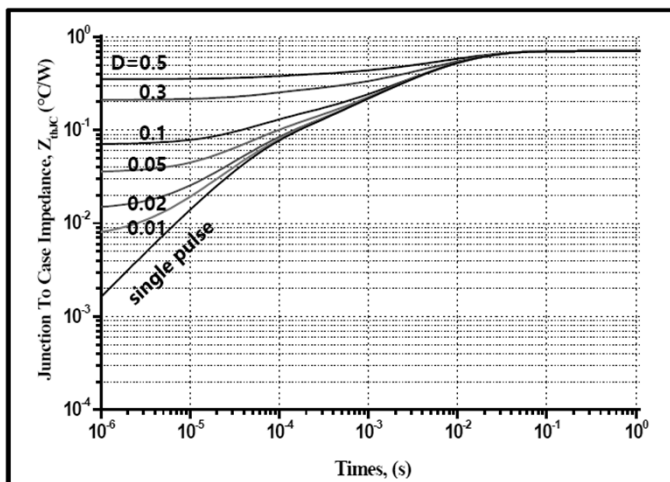


Figure 21. Transient Thermal Impedance

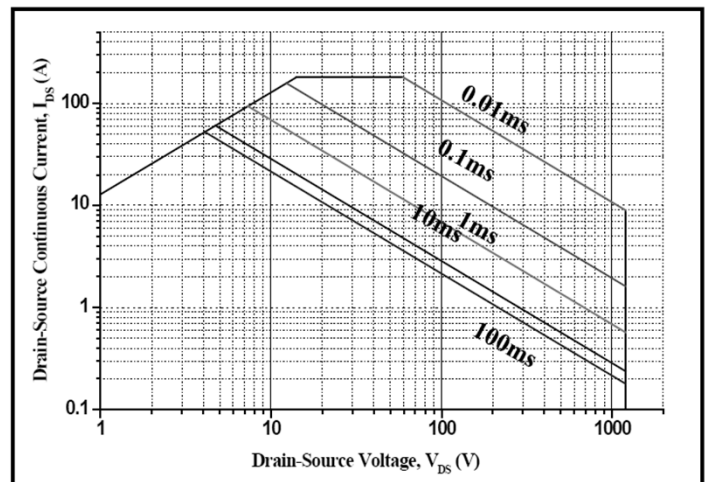
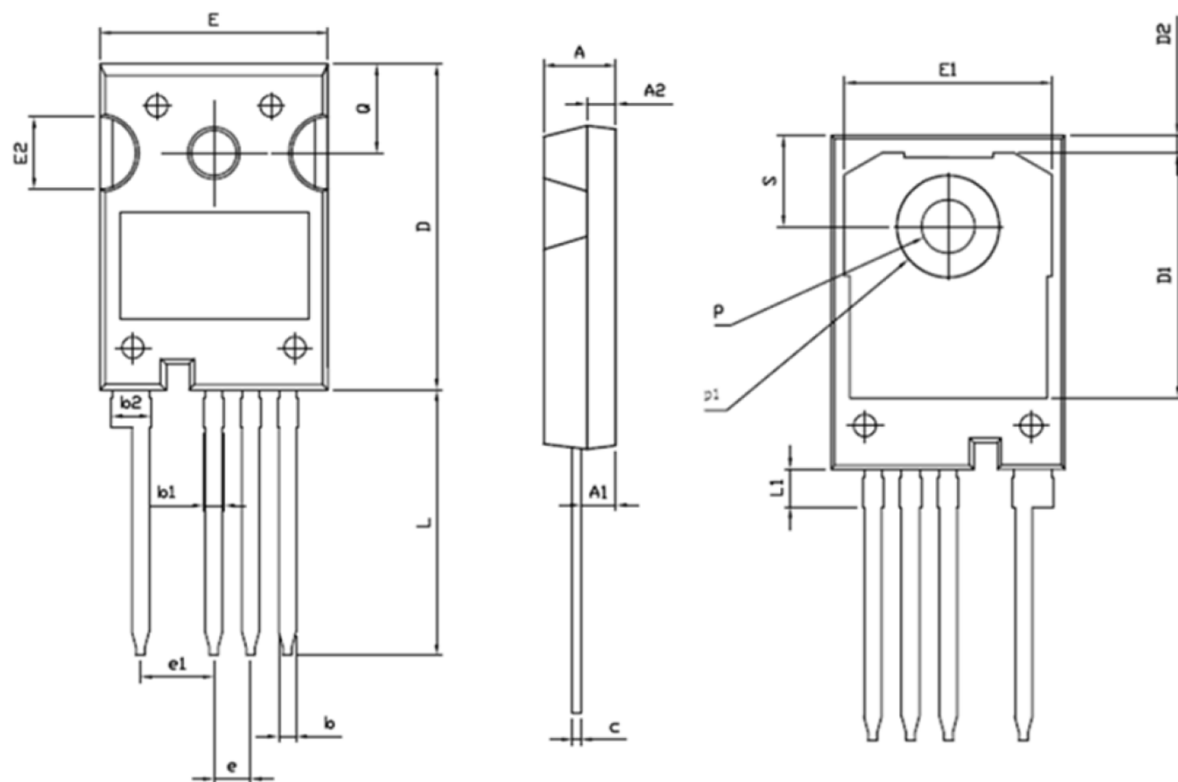


Figure 22. Safe Operating Area(Junction - Case)

Product dimension (TO-247-4L)



Dim	Millimeters			Dim	Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	4.80	5.00	5.20	e1	4.88	5.08	5.28
A1	2.25	2.40	2.55	E	15.60	15.80	16.00
A2	1.85	2.00	2.15	E1	13.50	14.00	14.50
b	0.55	0.6	0.68	E2	4.80	5.00	5.20
b1	1.07	1.2	1.33	L	18.08	18.38	18.68
b2	1.07	-	1.60	L1	2.38	2.58	2.78
c	2.39	-	2.94	p	3.50	3.60	3.70
D	2.39	2.53	2.69	p1	6.60	7.10	7.60
D1	23.3	23.45	23.6	Q	6.00	6.15	6.30
D2	15.75	15.94	16.13	S	6.00	6.15	6.30
e	16.25	16.55	16.85				

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