



100V 1.5mΩ N-Ch Power MOSFET

Features

- Ultra-low $R_{DS(ON)}$
- Low Gate Charge
- 100% UIS Tested, 100% R_g Tested
- Pb-free Lead Plating

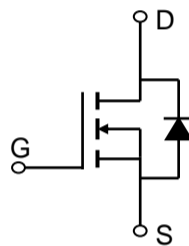
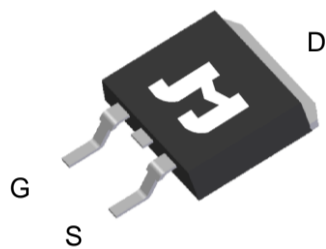
Product Summary

Parameter	Value	Unit
V_{DS}	100	V
$V_{GS(th)}_{Typ}$	2.9	V
I_D (@ $V_{GS} = 10V$) ⁽¹⁾	289	A
$R_{DS(ON)}_{Typ}$ (@ $V_{GS} = 10V$)	1.5	mΩ

Applications

- Power Management in Computing, CE, IE 4.0, Communications
- Current Switching in DC/DC & AC/DC (SR) Sub-systems
- Load Switching, Quick/Wireless Charging, Motor Driving

TO-263-3L Top View

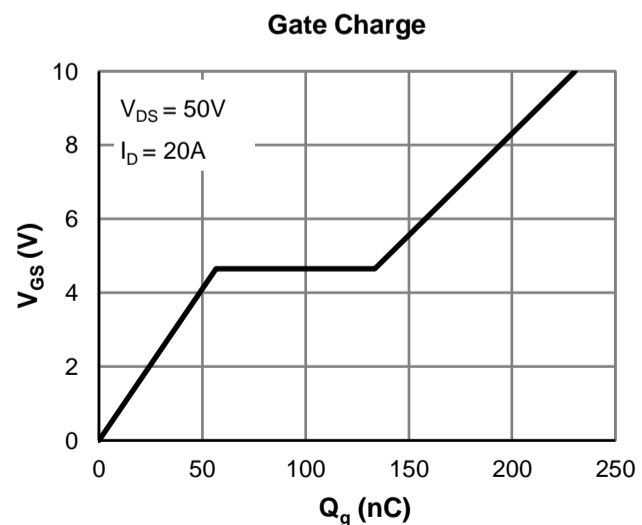
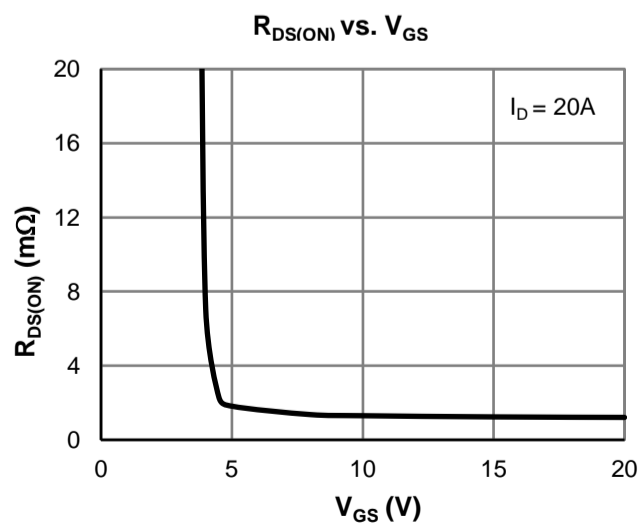


Ordering Information

Device	Package	# of Pins	Marking	MSL	T_J (°C)	Media	Quantity (pcs)
JBE101N-13	TO-263-3L	3	BE101N	3	-55 to 150	13-inch Reel	800

Absolute Maximum Ratings (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DS}	100	V
Gate-to-Source Voltage	V_{GS}	±20	V
Continuous Drain Current ⁽¹⁾	I_D	$T_C = 25^\circ\text{C}$	289
		$T_C = 100^\circ\text{C}$	183
Pulsed Drain Current ⁽²⁾	I_{DM}	1156	A
Avalanche Energy ⁽³⁾	E_{AS}	1823	mJ
Power Dissipation ⁽⁴⁾	P_D	$T_C = 25^\circ\text{C}$	278
		$T_C = 100^\circ\text{C}$	111
Junction & Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C





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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	100			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80\text{V}, V_{GS} = 0\text{V}$			1.0	μA
					5.0	
Gate-Body Leakage Current	I_{GSS}	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	2.0	2.9	4.0	V
Static Drain-Source ON-Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{V}, I_D = 20\text{A}$		1.5	1.8	$\text{m}\Omega$
Forward Transconductance	g_{FS}	$V_{DS} = 5\text{V}, I_D = 20\text{A}$		94		S
Diode Forward Voltage	V_{SD}	$I_S = 1\text{A}, V_{GS} = 0\text{V}$		0.70	1.0	V
Diode Continuous Current	I_S	$T_C = 25^\circ\text{C}$			278	A

DYNAMIC PARAMETERS ⁽⁵⁾

Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 20\text{V}, f = 1\text{MHz}$		12625.3		pF
Output Capacitance	C_{oss}			2099.7		pF
Reverse Transfer Capacitance	C_{rss}			269.0		pF
Gate Resistance	R_g	$V_{GS} = 0\text{V}, V_{DS} = 0\text{V}, f = 1\text{MHz}$		2.4		Ω

SWITCHING PARAMETERS ⁽⁵⁾

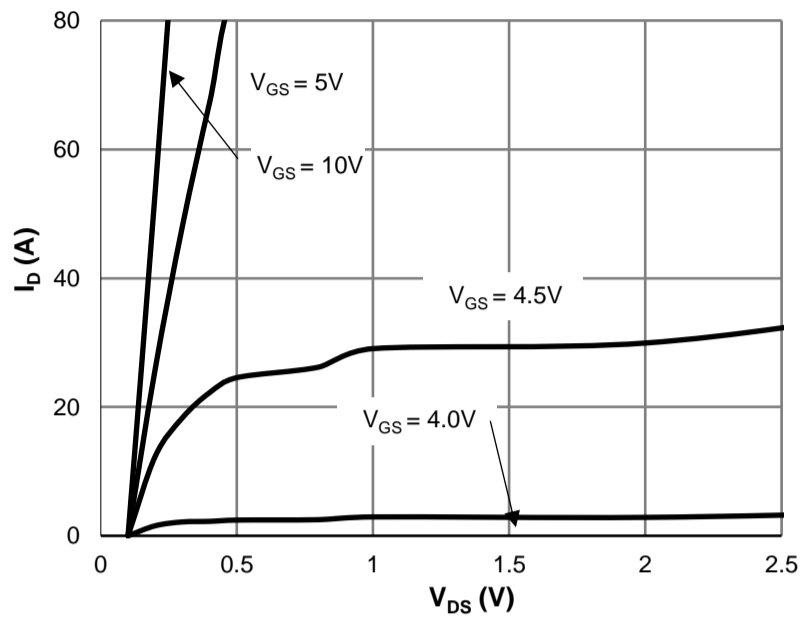
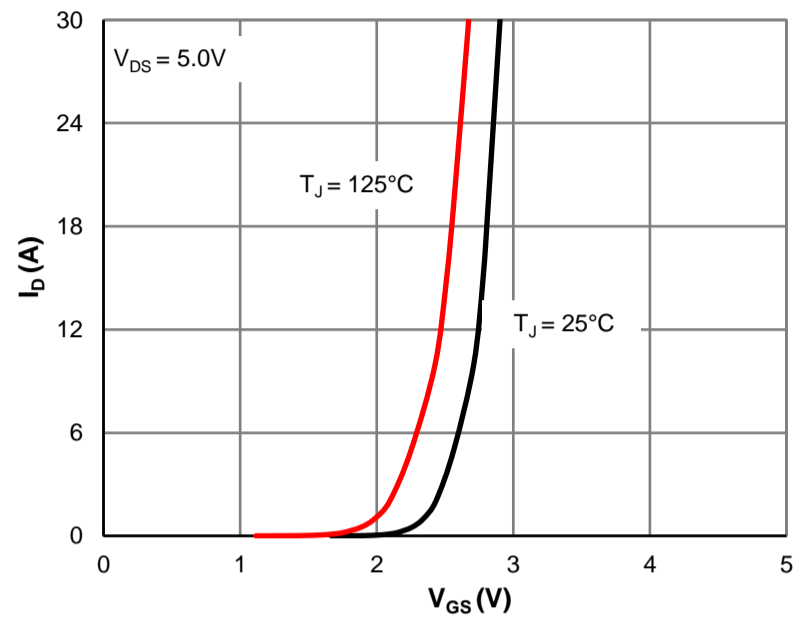
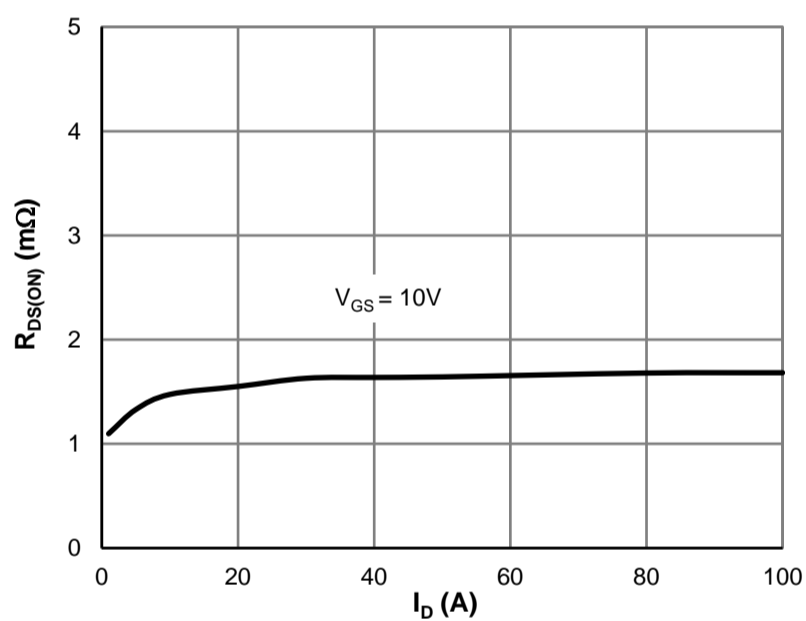
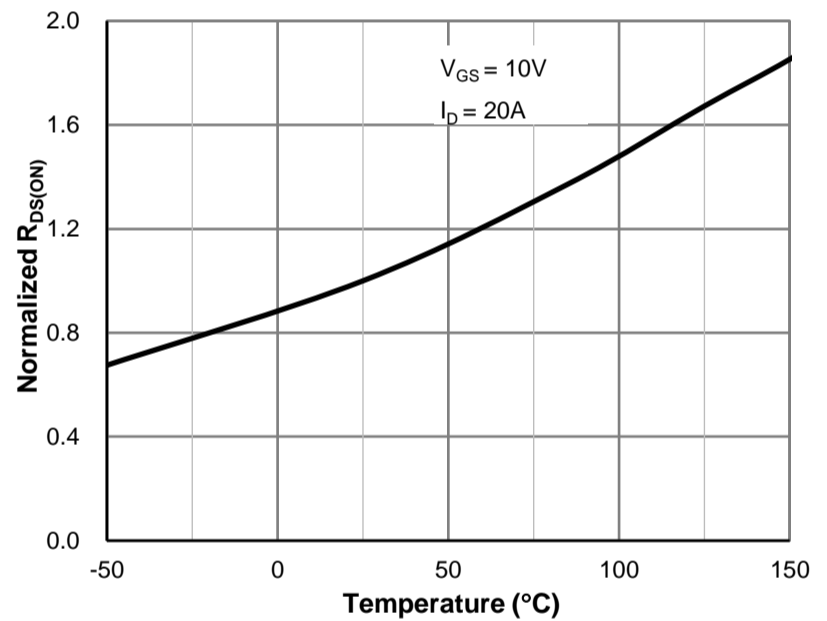
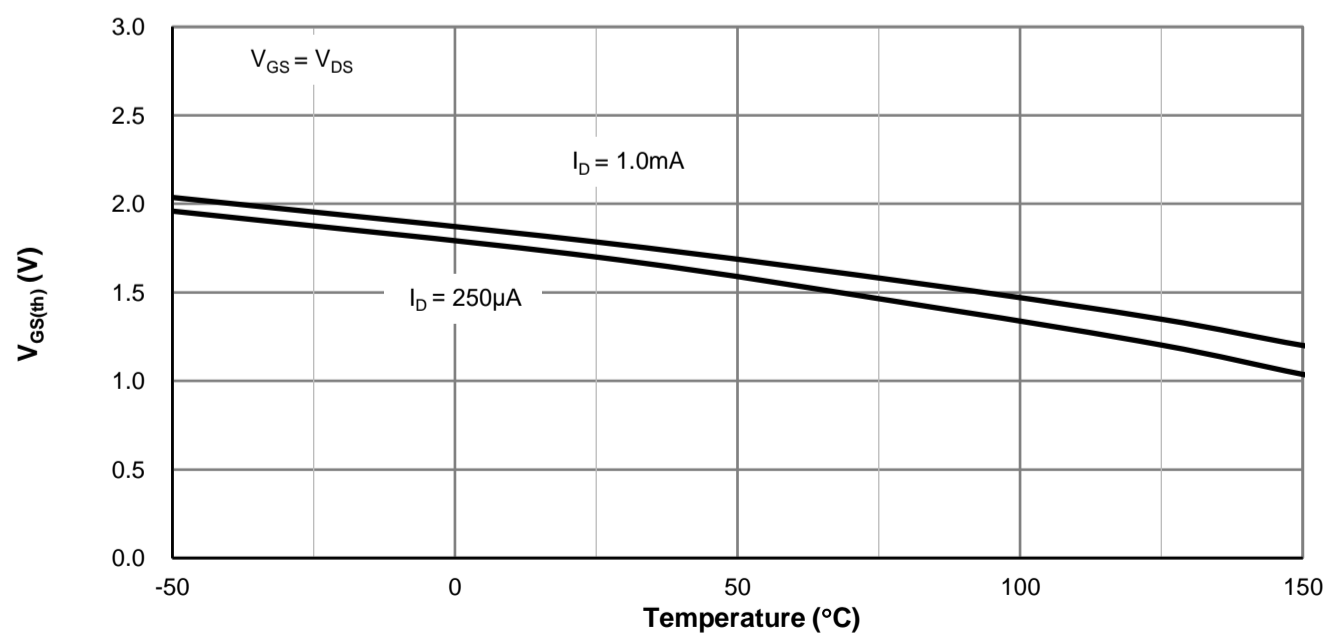
Total Gate Charge (@ $V_{GS} = 10\text{V}$)	Q_g	$V_{GS} = 0 \text{ to } 10\text{V}$ $V_{DS} = 20\text{V}, I_D = 20\text{A}$		230.5		nC
Total Gate Charge (@ $V_{GS} = 4.5\text{V}$)	Q_g			154.6		nC
Gate Source Charge	Q_{gs}			56.7		nC
Gate Drain Charge	Q_{gd}			76.8		nC
Turn-On DelayTime	$t_{D(on)}$			40.7		ns
Turn-On Rise Time	t_r	$V_{GS} = 10\text{V}, V_{DS} = 20\text{V}$ $R_L = 1.0\Omega, R_{GEN} = 3\Omega$		67.9		ns
Turn-Off DelayTime	$t_{D(off)}$			131		ns
Turn-Off Fall Time	t_f			90.96		ns
Body Diode Reverse Recovery Time	t_{rr}		$I_F = 15\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$		113	
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = 15\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$		274		nC

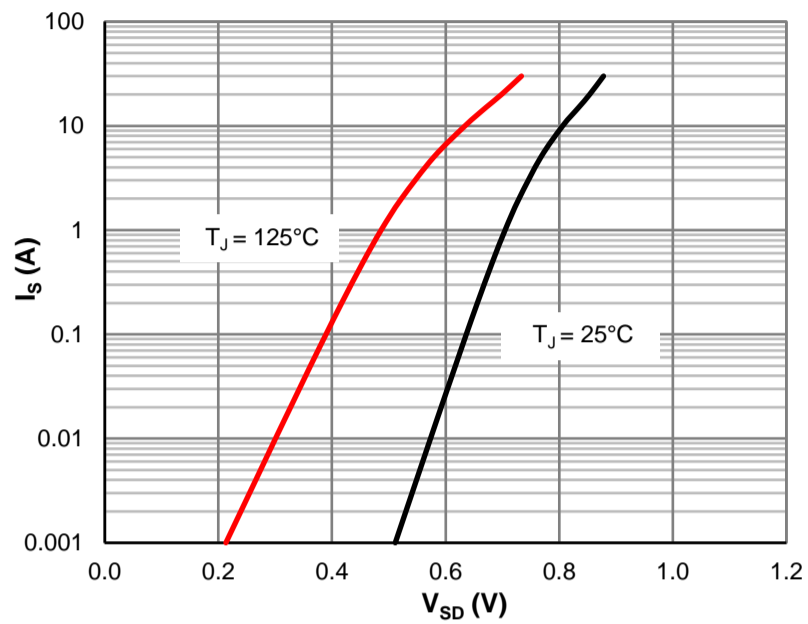
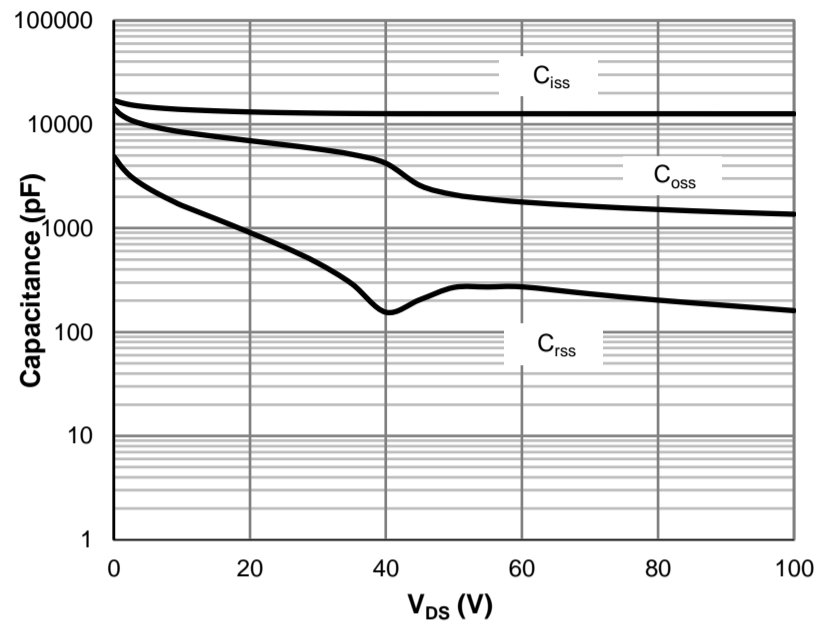
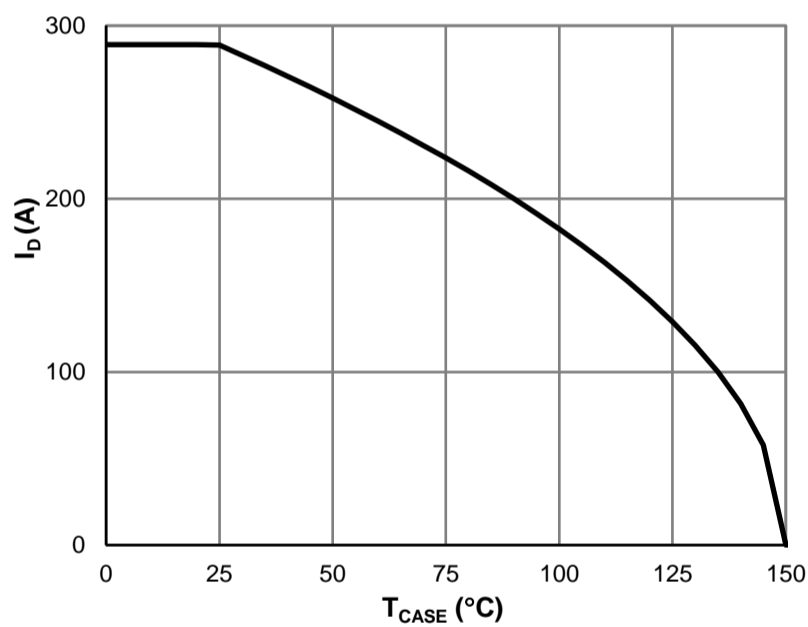
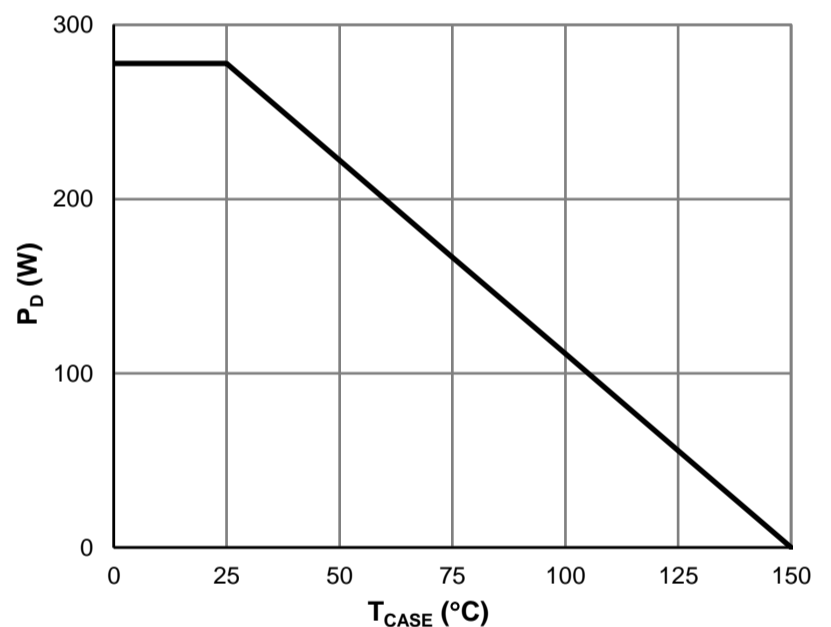
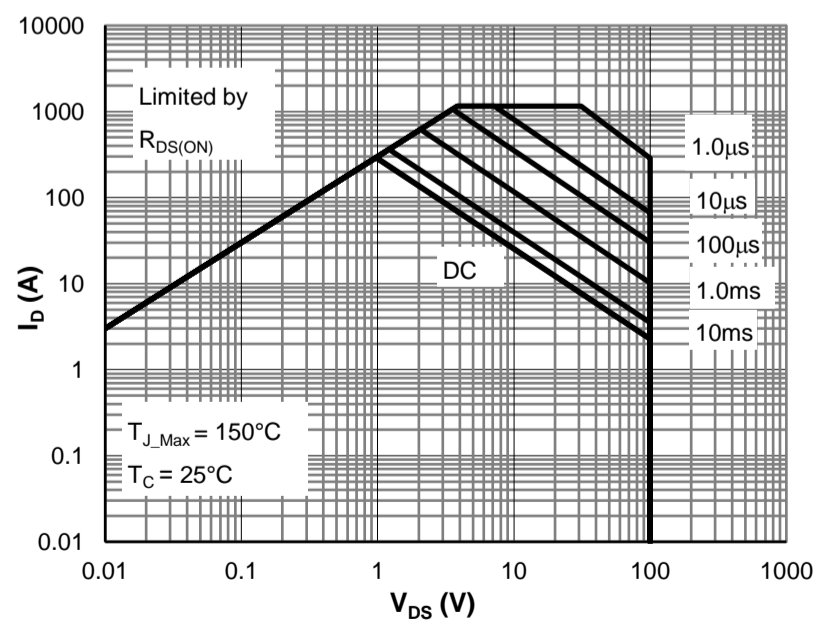
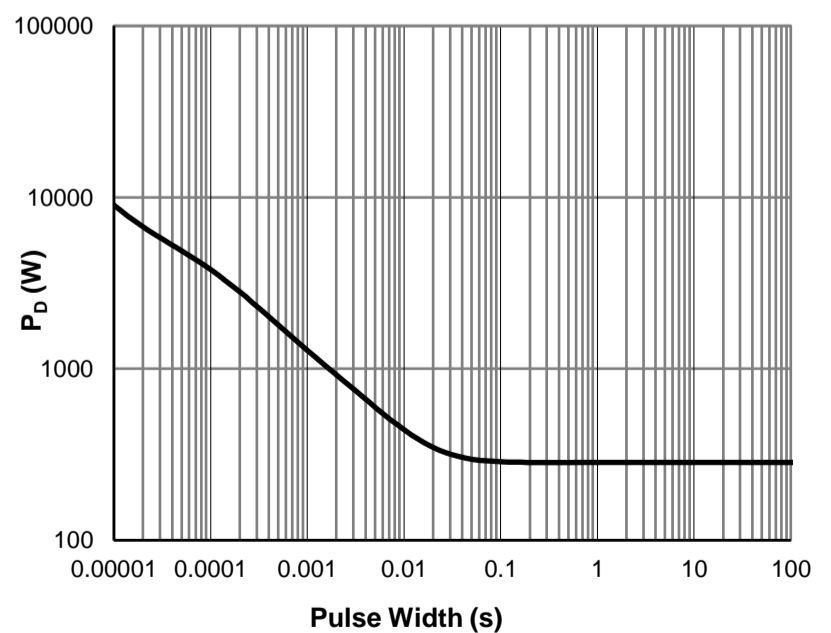
Thermal Performance

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	35	40	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.4	0.45	$^\circ\text{C}/\text{W}$

Notes:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. This single-pulse measurement was taken under $T_{J_Max} = 150^\circ\text{C}$.
3. E_{AS} of 1823 mJ is based on starting $T_J = 25^\circ\text{C}$, $L = 3.0\text{mH}$, $I_{AS} = 34.9\text{A}$, $V_{GS} = 10\text{V}$, $V_{DD} = 50\text{V}$; 100% test at $L = 0.1\text{mH}$, $I_{AS} = 99.6\text{A}$.
4. The power dissipation P_D is based on $T_{J_Max} = 150^\circ\text{C}$.
5. This value is guaranteed by design hence it is not included in the production test.

Typical Electrical & Thermal Characteristics

Figure 1: Saturation Characteristics

Figure 2: Transfer Characteristics

Figure 3: $R_{DS(ON)}$ vs. Drain Current

Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

Figure 5: $V_{GS(th)}$ vs. Junction Temperature

Typical Electrical & Thermal Characteristics

Figure 7: Body-Diode Characteristics

Figure 8: Capacitance Characteristics

Figure 9: Current De-rating

Figure 10: Power De-rating

Figure 11: Maximum Safe Operating Area

Figure 12: Single Pulse Power Rating, Junction-to-Case



Typical Electrical & Thermal Characteristics

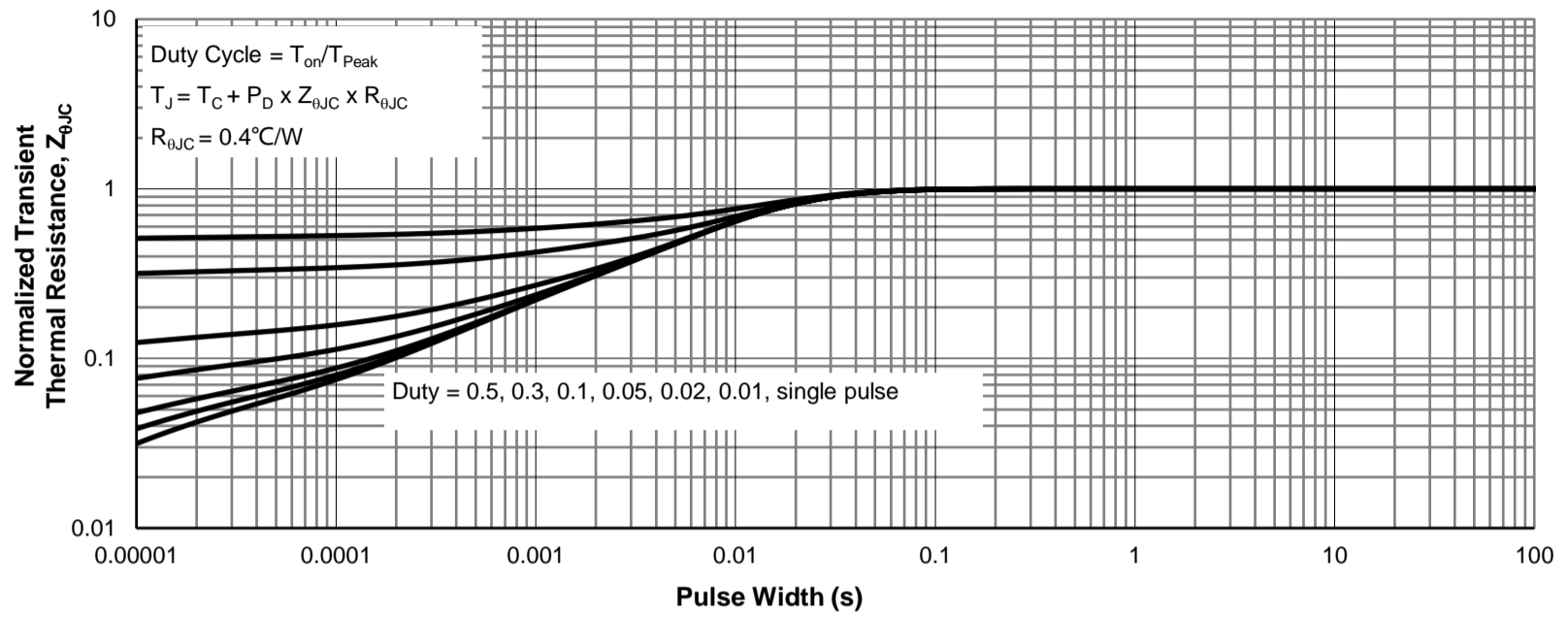
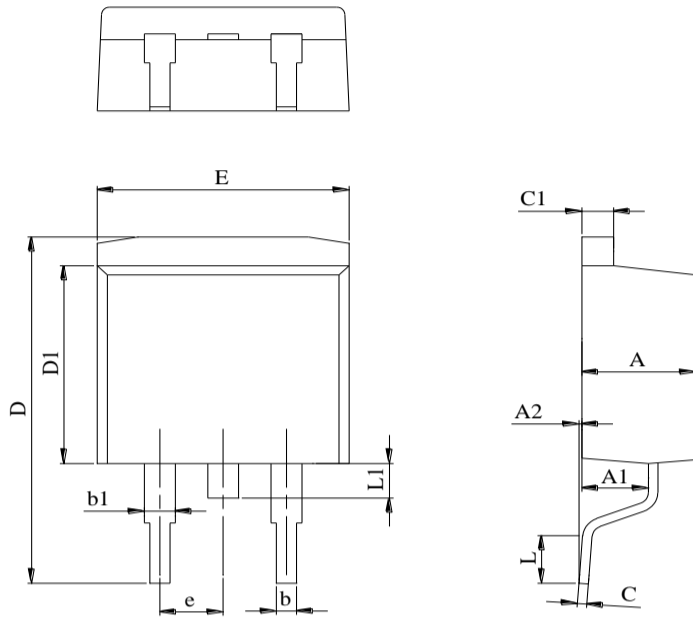


Figure 13: Normalized Transient Thermal Impedance



TO-263-3L Package Information

Package Outline



DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	4.24		4.77
A1	2.30		2.89
A2	0.00	0.10	0.25
b	0.70		0.96
b1	1.17		1.70
C	0.30		0.60
C1	1.15		1.42
D	14.10		15.88
D1	8.50		9.60
E	9.78		10.36
L	1.78		2.79
L1			1.75
e		2.54	

Recommend Soldering Footprint

