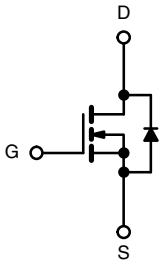
N-Channel 80 V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω) Max.	I_D (A)	Q_g (Typ.)
80	0.0048 at V_{GS} = 10 V	120[a]	161 nC

TO-220 Pin Configuration

Top View



N-Channel MOSFET

FEATURES

- DT-Trench Power MOSFET
- 100 % R_g and UIS Tested

RoHS COMPLIANT

APPLICATIONS

- Primary Side Switching
- Synchronous Rectification
- DC/AC Inverters
- LED Backlighting

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)				
Parameter		**Symbol**	**Limit**	**Unit**
Drain-Source Voltage		V_{DS}	80	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 150 °C)	T_C = 25 °C	I_D	120[a]	A
	T_C = 70 °C		92	
	T_A = 25 °C		35[b]	
	T_A = 70 °C		21[b]	
Pulsed Drain Current (t = 100 µs)		I_{DM}	460	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	120[a]	
	T_A = 25 °C		15[b]	
Single Pulse Avalanche Current	L = 0.1 mH	I_{AS}	110	
Single Pulse Avalanche Energy		E_{AS}	1450	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	255	W
	T_C = 70 °C		160	
	T_A = 25 °C		5[b]	
	T_A = 70 °C		3.3[b]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C
Soldering Recommendations (Peak Temperature)			260	

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Maximum Junction-to-Ambient[b, f]	t ≤ 10 s	R_{thJA}	10	16	°C/W
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	0.50	0.68	

Notes

a. Package limited.
b. Surface mounted on 1" x 1" FR4 board.

SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	80			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = 250 µA		37		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			- 6		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	1.5		3.5	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 64 V, V_{GS} = 0 V			1	µA
		V_{DS} = 64 V, V_{GS} = 0 V, T_J = 55 °C			10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	460			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 40 A		0.0048	0.006	Ω
Forward Transconductance[a]	g_{fs}	V_{DS} = 25 V, I_D = 20 A		90		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} =64 V, V_{GS} = 0 V, f = 1 MHz		6255		pF
Output Capacitance	C_{oss}			550		
Reverse Transfer Capacitance	C_{rss}			366		
Total Gate Charge	Q_g	V_{DS} = 64 V,V_{GS} = 10 V, I_D = 40 A		161		nC
		V_{DS} = 64 V, V_{GS} = 6 V, I_D = 30 A		95		
		V_{DS} = 64 V,V_{GS} = 4.5 V, I_D = 20 A		80		
Gate-Source Charge	Q_{gs}			33		
Gate-Drain Charge	Q_{gd}			12		
Output Charge	Q_{oss}	V_{DS} = 50 V, V_{GS} = 0 V		61		
Gate Resistance	R_g	f = 1 MHz		1.5		Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 40 V, R_L = 4 Ω I_D ≅ 10 A, V_{GEN} = 10 V, R_g = 1 Ω		24		ns
Rise Time	t_r			20		
Turn-Off DelayTime	$t_{d(off)}$			83		
Fall Time	t_f			28		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 40 V, R_L = 4 Ω I_D ≅ 10 A, V_{GEN} = 6.0 V, R_g = 1 Ω		25		
Rise Time	t_r			73		
Turn-Off DelayTime	$t_{d(off)}$			34		
Fall Time	t_f			28		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			120	A
Pulse Diode Forward Current (t = 100 µs)	I_{SM}				460	
Body Diode Voltage	V_{SD}	I_S = 5 A		0.7	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = 10 A, dI/dt = 100 A/µs, T_J = 25 °C		39		ns
Body Diode Reverse Recovery Charge	Q_{rr}			32		nC
Reverse Recovery Fall Time	t_a			20		ns
Reverse Recovery Rise Time	t_b			19		

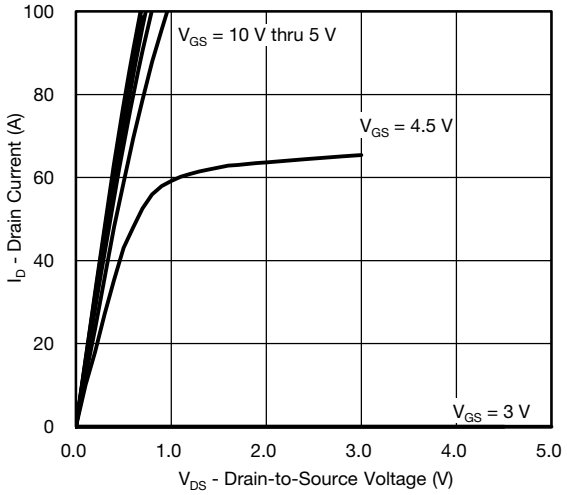
Notes

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.

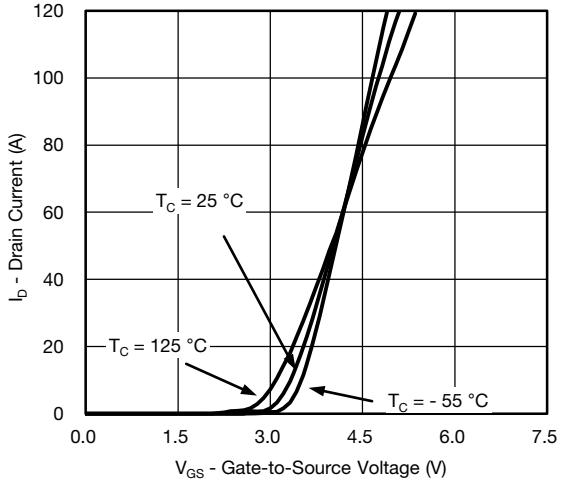
b. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

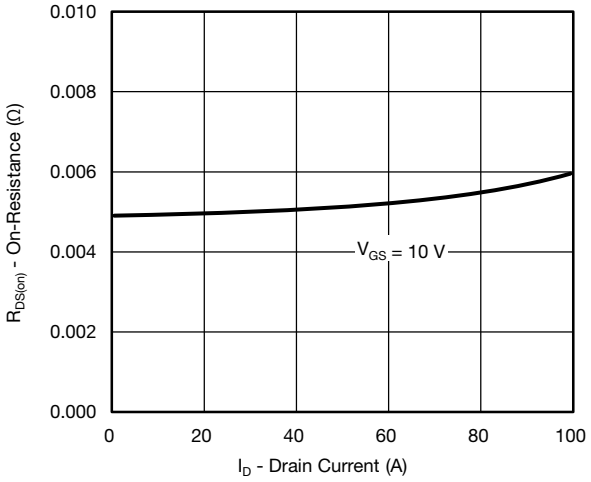
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



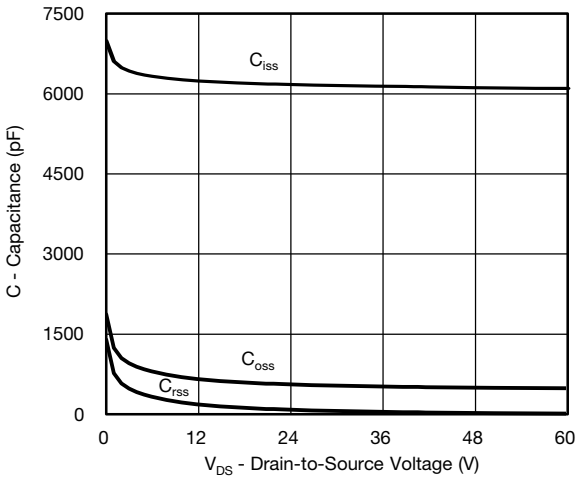
Output Characteristics



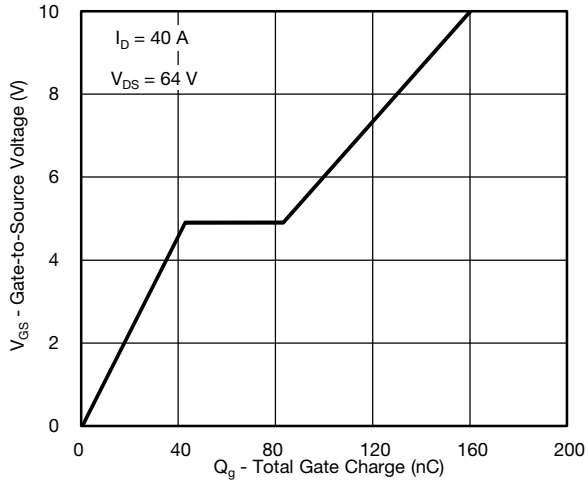
Transfer Characteristics



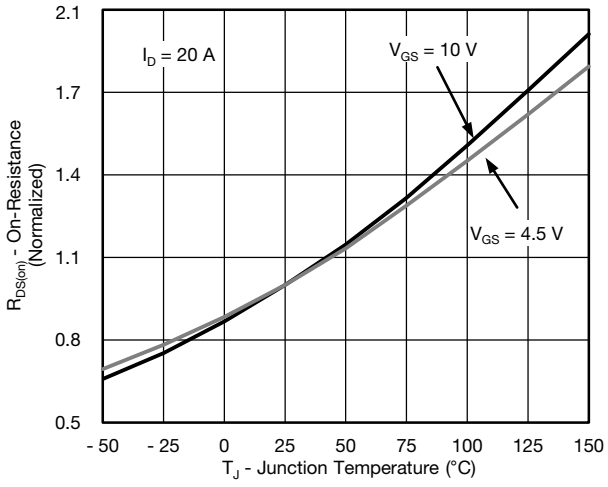
On-Resistance vs. Drain Current



Capacitance

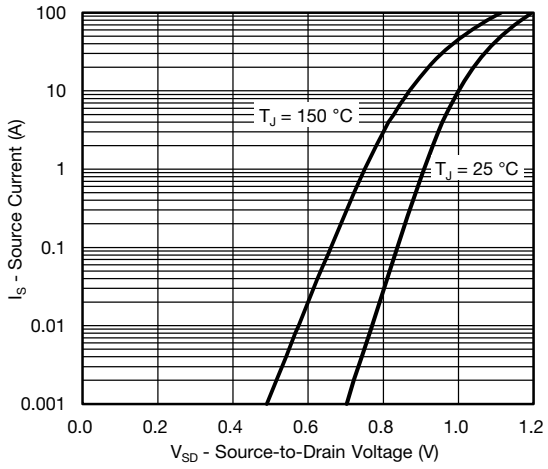


Gate Charge

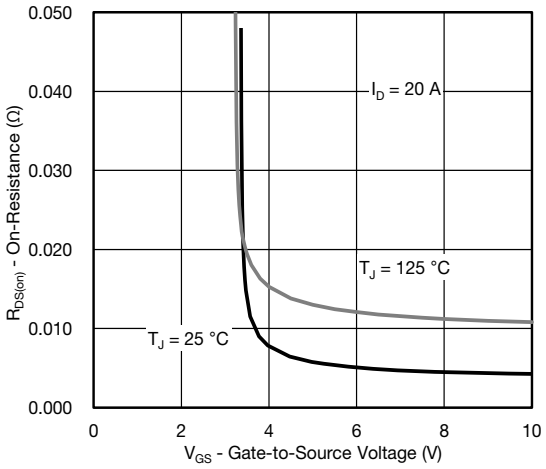


On-Resistance vs. Junction Temperature

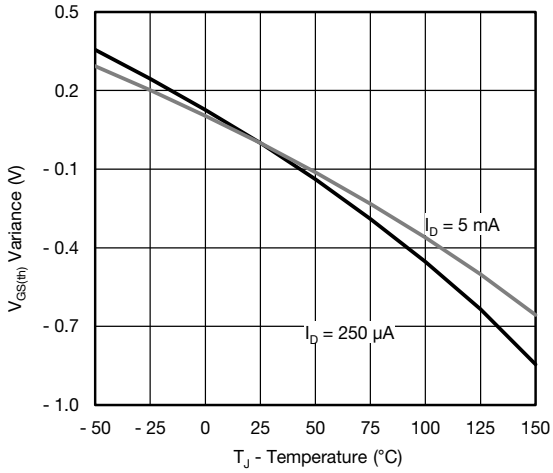
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



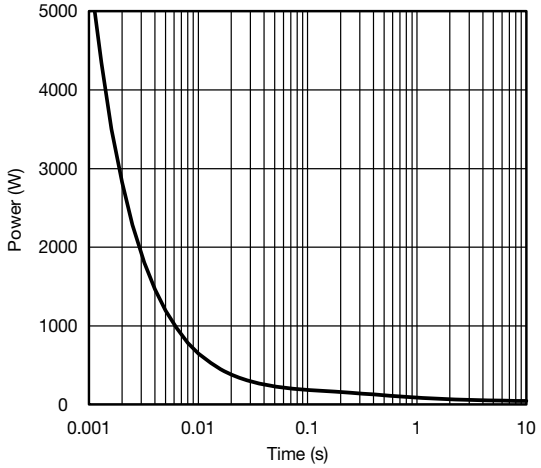
Source-Drain Diode Forward Voltage



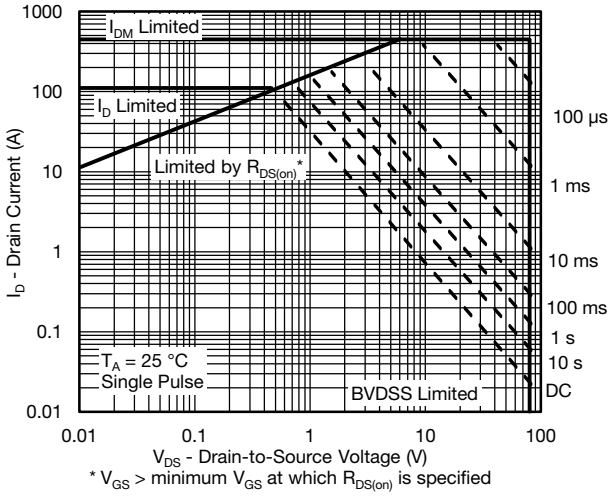
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

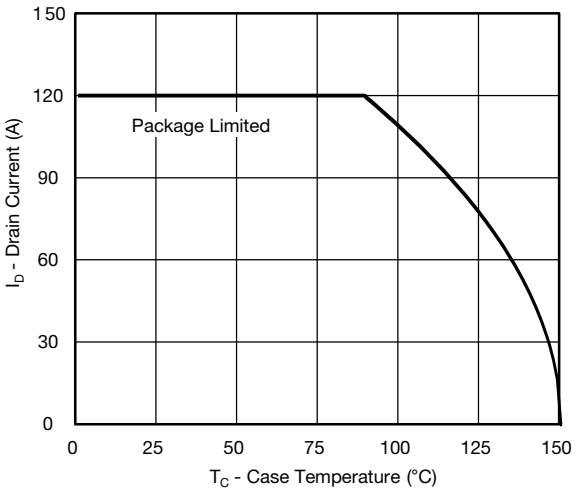


Single Pulse Power, Junction-to-Ambient

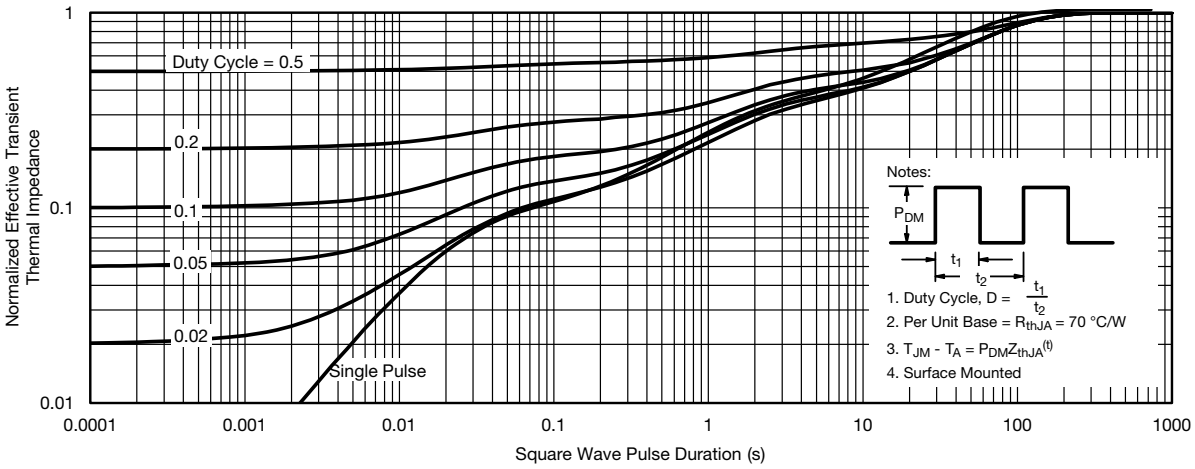


Safe Operating Area, Junction-to-Ambient

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

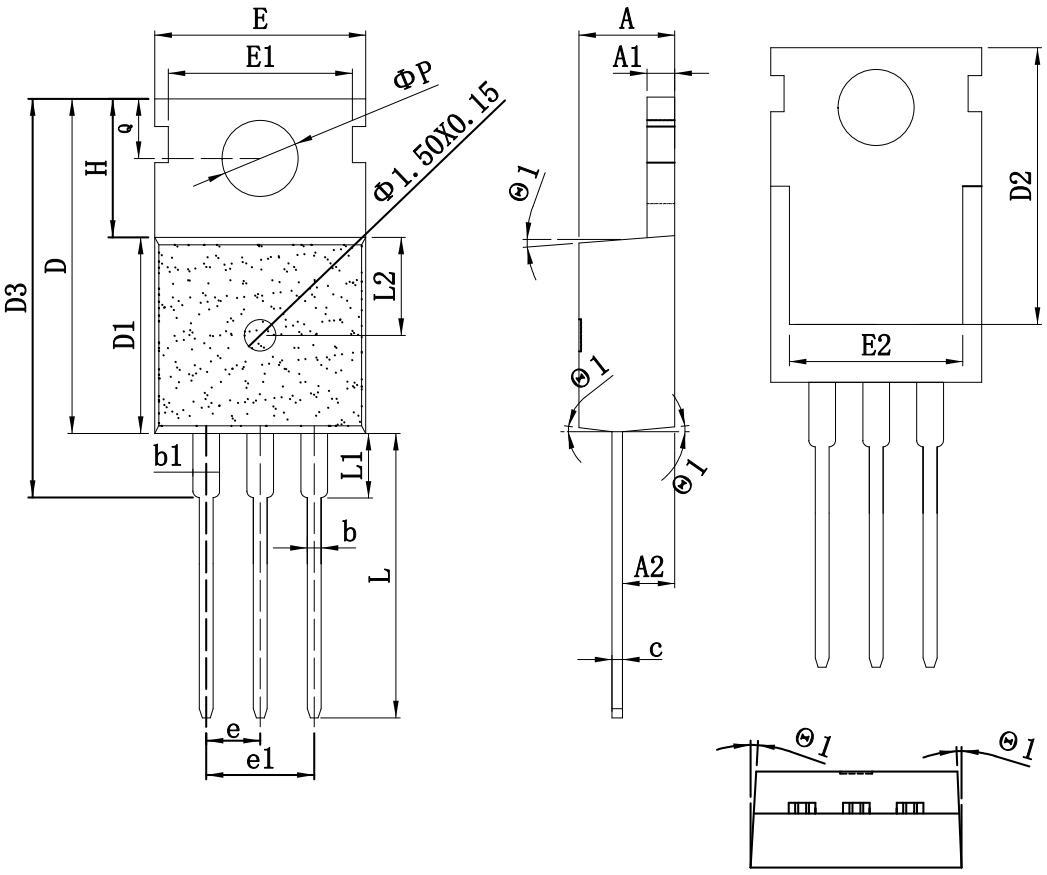


Current Derating*



Normalized Thermal Transient Impedance, Junction-to-Ambient

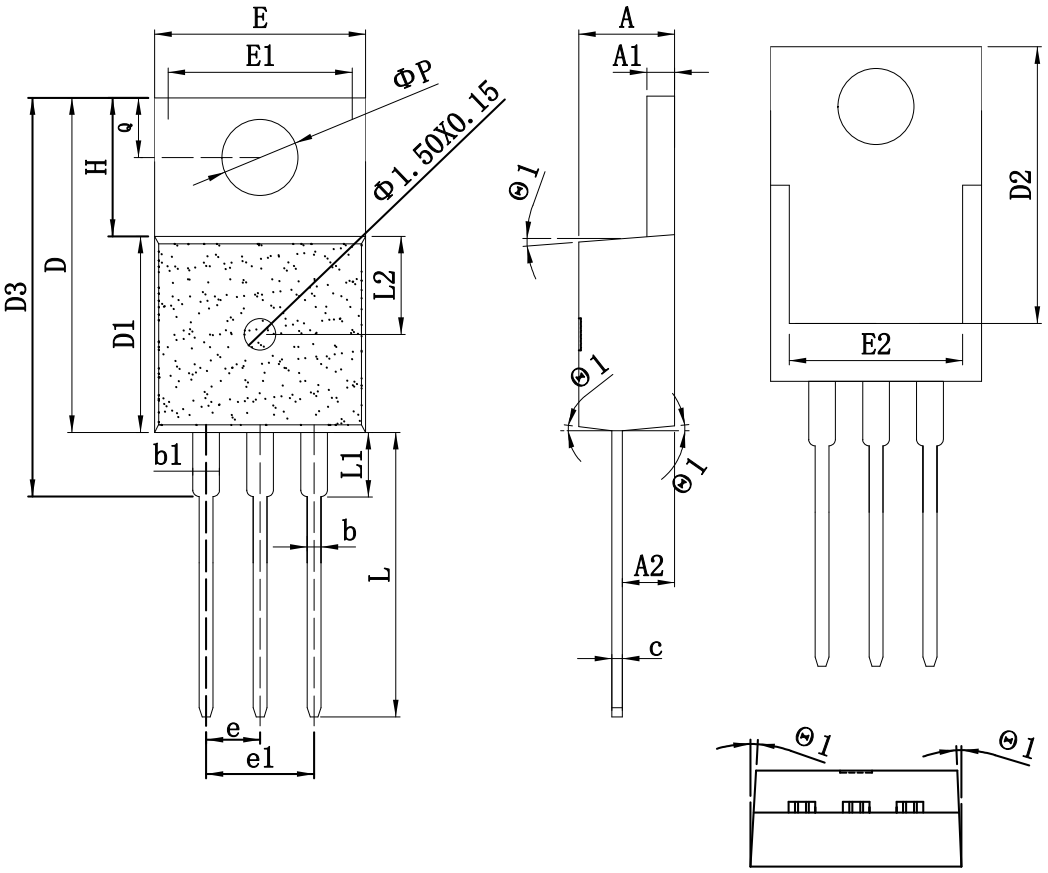
TO-220_3L-A PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	mm			SYMBOL	mm		
	MIN	TYP	MAX		MIN	TYP	MAX
A	4.15	4.50	4.80	E1	8.25	8.70	9.15
A1	1.15	1.30	1.50	E2	7.20	8.00	8.80
A2	2.10	2.40	2.65	e	2.38	2.54	2.74
b	0.65	0.80	1.00	e1	5.08REF		
b1	1.10	1.33	1.80	H	6.20	6.50	6.90
c	0.35	0.50	0.65	L	12.75	13.28	13.70
D	14.25	15.75	16.15	L1	-	-	3.50
D1	8.70	9.20	9.60	L2	2.30	4.65	7.00
D2	12.30	13.10	13.85	ϕP	3.40	3.65	3.85
D3	16.20	18.80	20.60	Q	2.50	2.80	3.00
E	8.68	10.02	11.00	θ	2°	-	7°

TO-220_3L-B PACKAGE OUTLINE



COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	mm			SYMBOL	mm		
	MIN	TYP	MAX		MIN	TYP	MAX
A	4.15	4.50	4.80	E1	8.25	8.70	9.15
A1	1.15	1.30	1.50	E2	7.20	8.00	8.80
A2	2.10	2.40	2.65	e	2.38	2.54	2.74
b	0.65	0.80	1.00	e1	5.08REF		
b1	1.10	1.33	1.80	H	6.20	6.50	6.90
c	0.35	0.50	0.65	L	12.75	13.28	13.70
D	14.25	15.75	16.15	L1	-	-	3.50
D1	8.70	9.20	9.60	L2	2.30	4.65	7.00
D2	12.30	13.10	13.85	ϕP	3.40	3.65	3.85
D3	16.20	18.80	20.60	Q	2.50	2.80	3.00
E	8.68	10.02	11.00	θ	2°	-	7°

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