

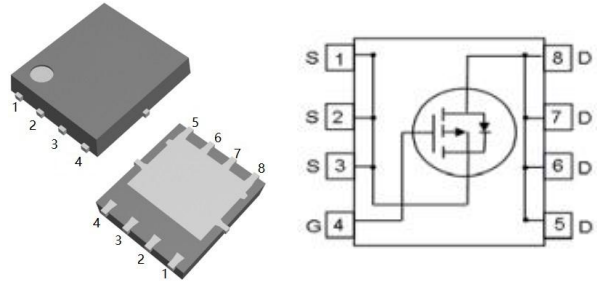
## D30P03HL

### -30 Amps, -30 Volts P-CHANNEL MOSFET

#### FEATURE

- -30A, -30V,  $R_{DS(ON)MAX}=15m\Omega @V_{GS}=-10V/-15A$   
 $R_{DS(ON)MAX}=25m\Omega @V_{GS}=-4.5V/-15A$
- Low gate charge
- Low  $C_{iss}$
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS 2.0 Compliant

#### DFN3\*3



#### Absolute Maximum Ratings ( $T_C=25^\circ C$ , unless otherwise noted)

Parameter	Symbol	D30P03HL	UNIT
Drain-Source Voltage	$V_{DSS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current	$I_D$	-30	A
Pulsed Drain Current (Note 1)	$I_{DM}$	-90	
Single Pulse Avalanche Energy (Note 2)	$E_{AS}$	151	mJ
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55to+150	$^\circ C$
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	$T_L$	260	$^\circ C$

#### Thermal Characteristics

Parameter	Symbol	D30P03HL	Units
Thermal resistance, Junction to Case	$R_{th(j-c)}$	5.5	$^\circ C/W$
Maximum Power Dissipation	$P_D$	22.7	W

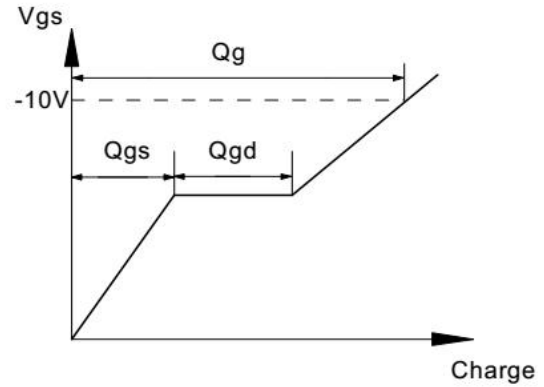
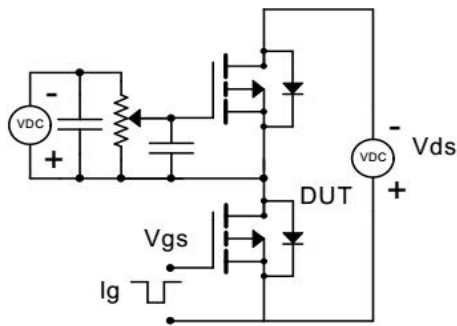
$T_C=25^\circ C$

Electrical Characteristics (T <sub>e</sub> =25°C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-30	—	—	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V	—	—	-1	uA
Gate-Body Leakage Current, Forward	I <sub>GSSF</sub>	V <sub>GS</sub> =20V, V <sub>DS</sub> =0V	—	—	100	nA
Gate-Body Leakage Current, Reverse	I <sub>GSSR</sub>	V <sub>GS</sub> =-20V, V <sub>DS</sub> =0V	—	—	-100	nA
<b>On Characteristics</b>						
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-1.2	—	-2.5	V
Drain-Source On-State Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-15A	—	10	15	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-15A	—	18	25	
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1.0MHZ	—	2219	—	pF
Output Capacitance	C <sub>oss</sub>		—	310	—	pF
Reverse Transfer Capacitance	C <sub>rss</sub>		—	216	—	pF
<b>Switching Characteristics</b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =-15V, I <sub>D</sub> =-15A, V <sub>GS</sub> =-10V, R <sub>G</sub> =2.2Ω	—	8.6	—	ns
Turn-On Rise Time	t <sub>r</sub>		—	6.4	—	ns
Turn-Off Delay Time	t <sub>d(off)</sub>		—	46	—	ns
Turn-Off Fall Time	t <sub>f</sub>		—	17	—	ns
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-15V, V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-13.9A	—	45	—	nC
Gate-Source Charge	Q <sub>gs</sub>		—	15	—	nC
Gate-Drain Charge	Q <sub>gd</sub>		—	10	—	nC
<b>Drain-Source Body Diode Characteristics and Maximum Ratings</b>						
Continuous Diode Forward Current	I <sub>S</sub>		—	—	-30	A
Pulsed Diode Forward Current	I <sub>SM</sub>		—	—	-90	A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-1A, V <sub>GS</sub> =0V	—	—	-1.2	V

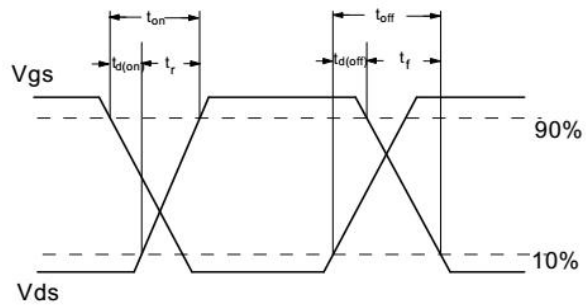
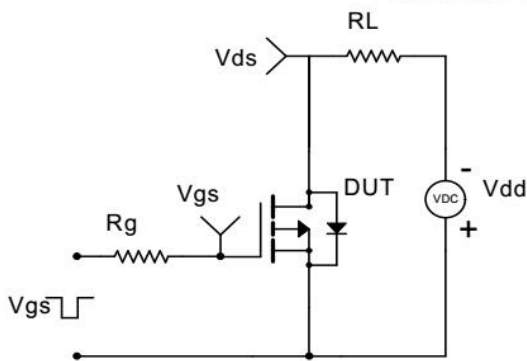
**Notes**

1. Repetitive Rating; pulse width limited by maximum junction temperature .
2. L=0.5mH, R<sub>g</sub>=25Ω, T<sub>j</sub>=25°C.
3. Pulse width≤300us; duty cycle≤2%.

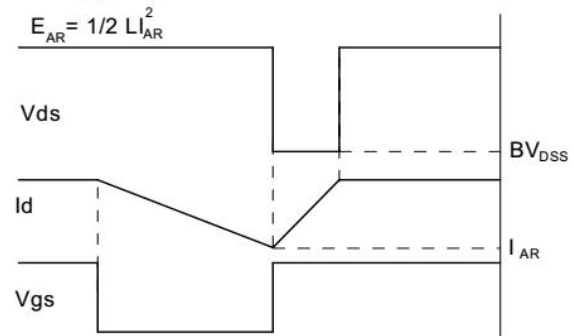
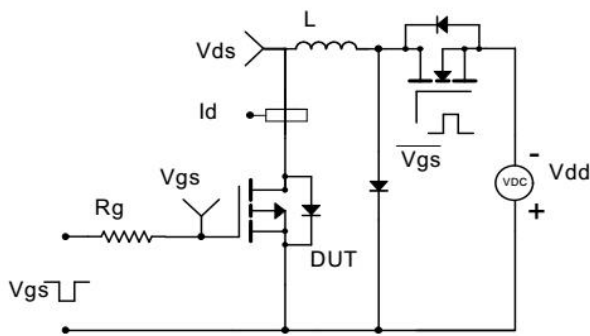
**Gate Charge Test Circuit & Waveform**



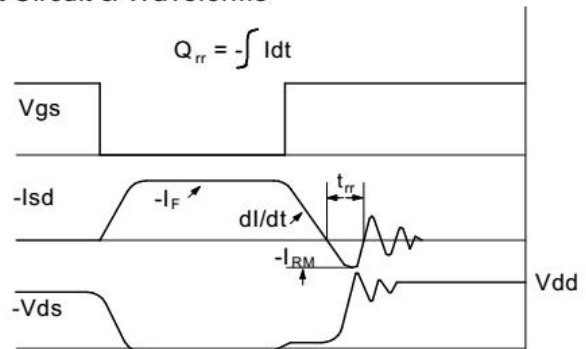
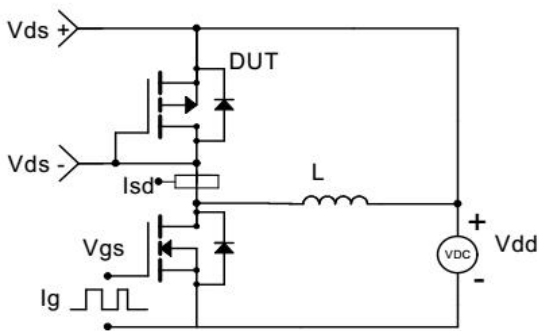
**Resistive Switching Test Circuit & Waveforms**



**Unclamped Inductive Switching (UIS) Test Circuit & Waveforms**



**Diode Recovery Test Circuit & Waveforms**



**RATING AND CHARACTERISTIC CURVES**

Figure.1 Typical Output Characteristics

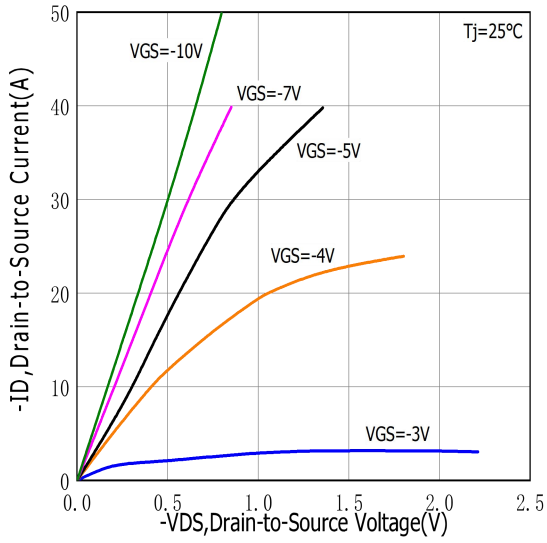


Figure.2 Typical Gate Charge vs Gate to Source Voltage

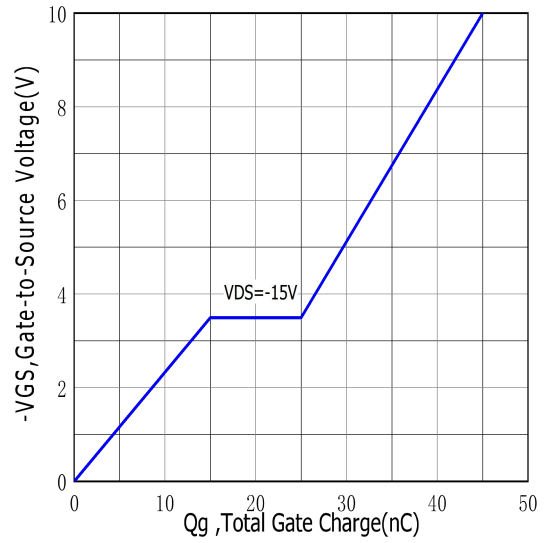


Figure.3 Typical Body Diode Transfer Characteristics

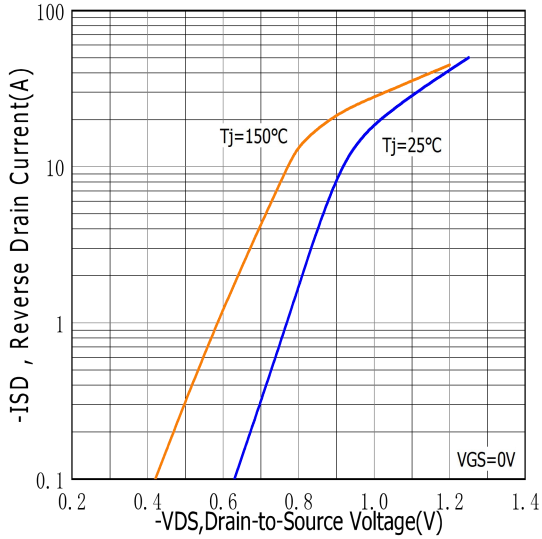


Figure.4 Typical Capacitance vs Drain to Source Voltage

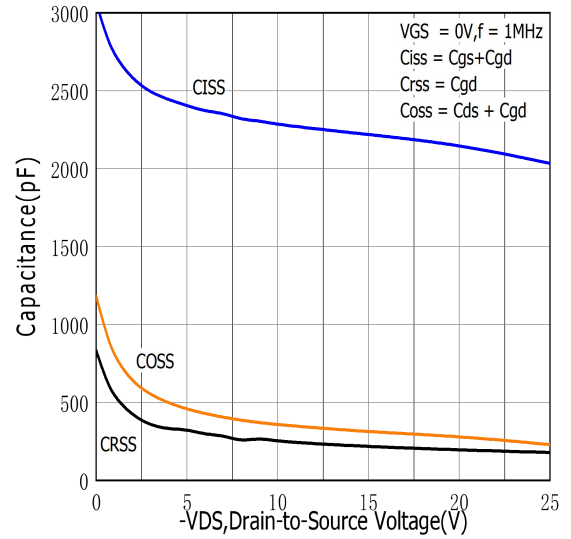


Figure.5 Typical Breakdown Voltage vs Junction Temperature

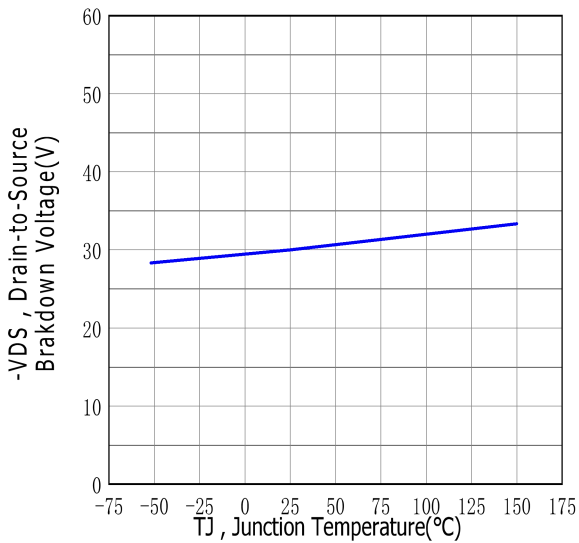


Figure.6 Typical Drain to Source on Resistance vs Junction Temperature

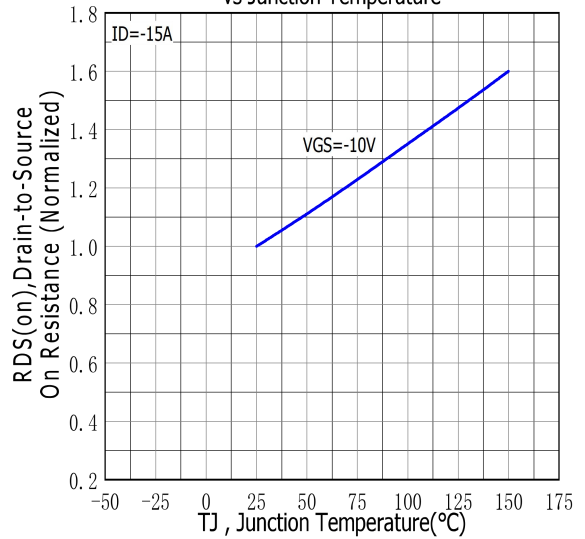


Figure.7 Maximum Forward Bias Safe Operating Area

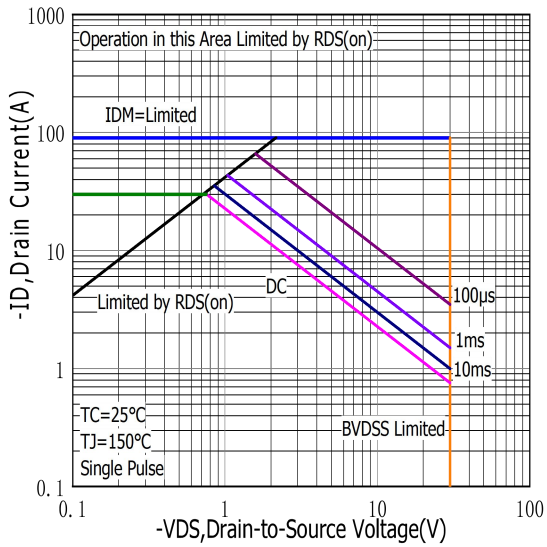


Figure.8 Typical Drain to Source ON Resistance vs Drain Current

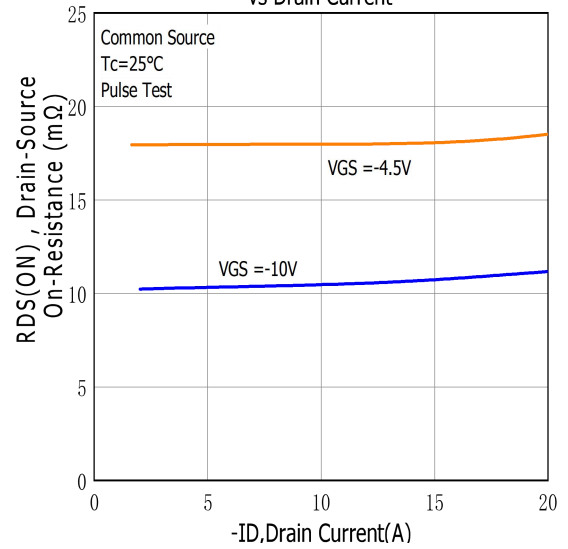


Figure.9 Maximum EAS vs Channel Temperature

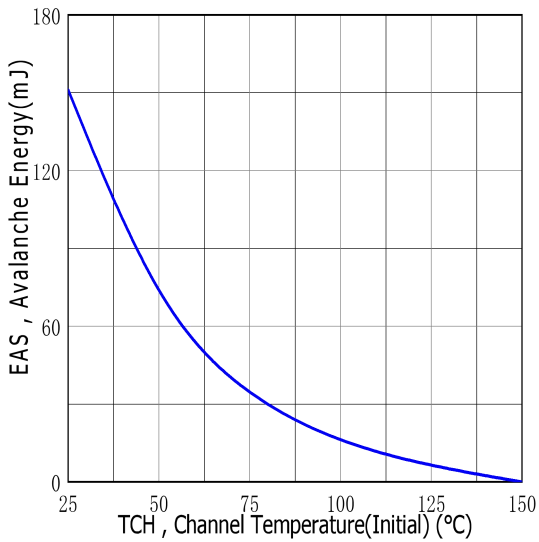


Figure.10 Typical Threshold Voltage vs Case Temperature

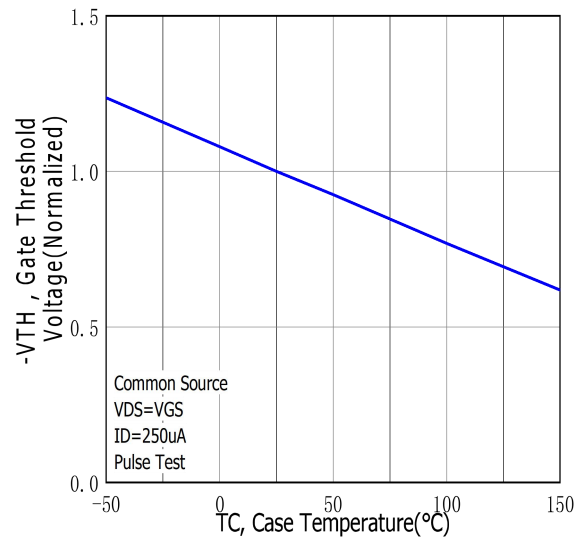


Figure.11 Maximum Effective Thermal Impedance, Junction to Case

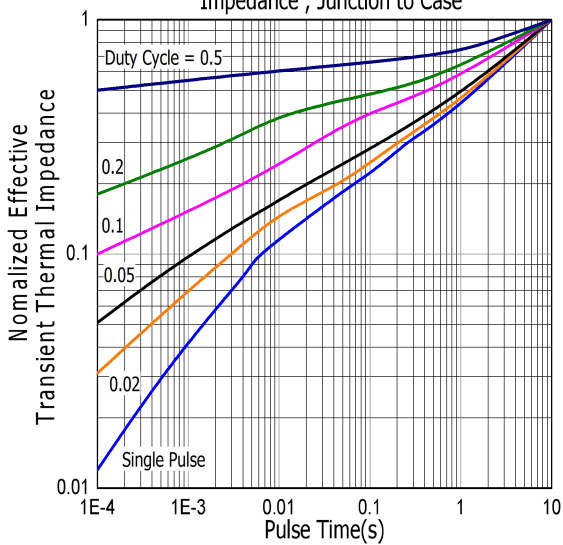
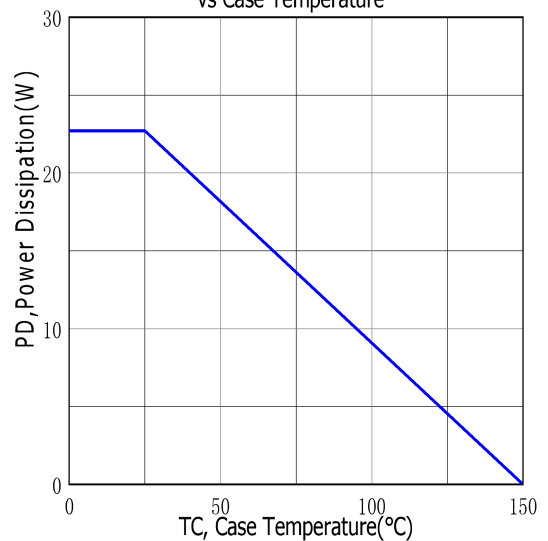
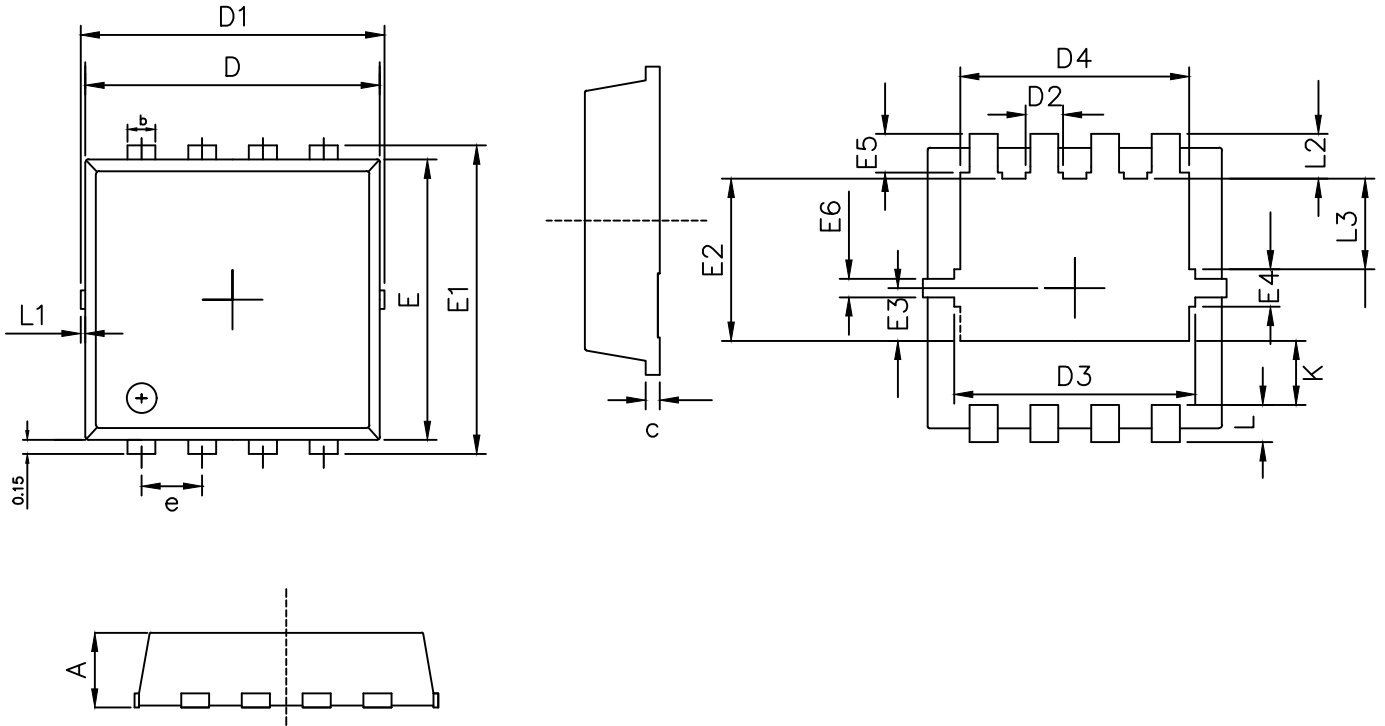


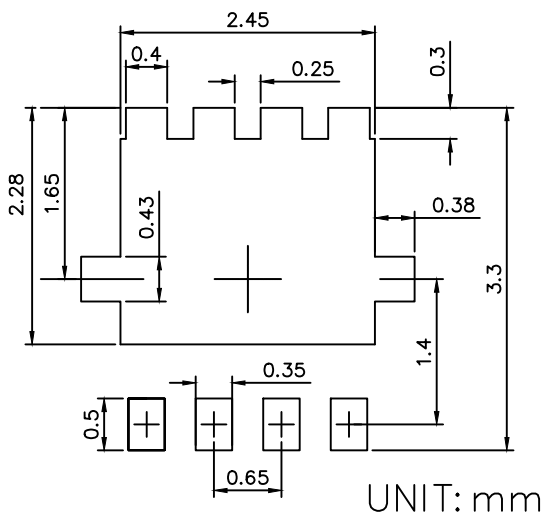
Figure.12 Maximum Power Dissipation vs Case Temperature



## DFN3x3 PACKAGE OUTLINE



### RECOMMENDED LAND PATTERN



	MIN	NOM	MAX
A	0.70	0.85	1.00
b	0.24	0.30	0.40
c	0.10	0.15	0.25
D	3.00	3.15	3.25
D1	3.10	3.25	3.50
D2	0.30	0.40	0.50
D3	2.50	2.58	2.70
D4	2.35	2.45	2.55
E	2.90	3.00	3.10
E1	3.15	3.30	3.45
E2	1.65	1.75	1.85
E3	0.48	0.58	0.68
E4	0.23	0.40	0.50
E5	0.20	0.30	0.40
E6	0.075	0.17	0.25
e	0.55	0.65	0.75
K	0.52	0.72	0.82
L	0.25	0.40	0.55
L1	0.00	0.05	0.10
L2	0.28	0.43	0.58
L3	0.88	0.98	1.08