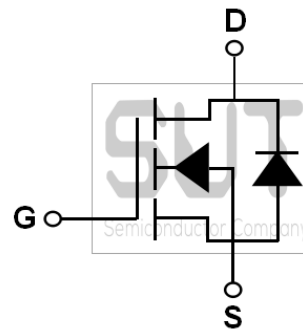


## N-Channel 30-V<sub>(D-S)</sub> MOSFET

PRODUCT SUMMARY		
B <sub>VDSS</sub> (V)	R <sub>DS(on)</sub> (mΩ)(MAX)	I <sub>D</sub> (A)
30	4.0@V <sub>GS</sub> =10V	90

### PPAK5x6 Pin Configuration



### ABSOLUTE MAXIMUM RATINGS(T<sub>C</sub>=25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V <sub>DS</sub>	30	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Drain Current-Continuous (T <sub>C</sub> =25°C)	I <sub>D</sub>	90	A
Drain Current-Continuous (T <sub>C</sub> =100°C)		57	A
Drain Current-Pulsed <sup>1</sup>	I <sub>DM</sub>	360	A
Single Pulse Avalanche Energy <sup>2</sup>	EAS	125	mJ
Single Pulse Avalanche Current <sup>2</sup>	IAS	50	A
Power Dissipation (T <sub>C</sub> =25°C)	P <sub>D</sub>	115	W
Power Dissipation-Derate above 25°C		0.77	W/°C
Storage Temperature Range	T <sub>STG</sub>	-55 to 175	°C
Operating Junction Temperature Range	T <sub>J</sub>	-55 to 175	°C

### THERMAL CHARACTERISTICS

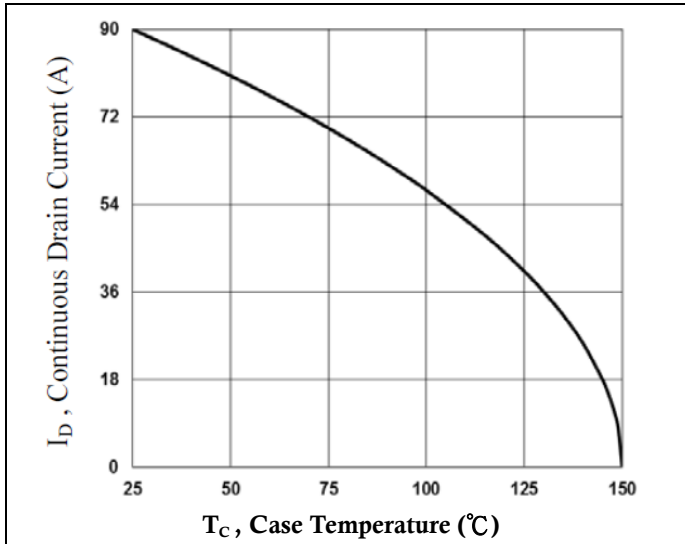
Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to ambient	R <sub>θJA</sub>	---	62	°C/W
Thermal Resistance Junction to Case	R <sub>θJC</sub>	---	1.3	°C/W

ELECTRICAL CHARACTERISTICS (T <sub>J</sub> =25°C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static State Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	30	---	---	V
BV <sub>DSS</sub> Temperature Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Reference to 25°C, I <sub>D</sub> =1mA	---	0.04	---	V/°C
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =30V, T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>GS</sub> =0V, V <sub>DS</sub> =24V, T <sub>J</sub> =125°C	---	---	10	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
Static Drain-Source On-Resistance <sup>3</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	---	3.0	4.0	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A	---	4.2	5.5	mΩ
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1.0	1.6	2.5	V
V <sub>GS(th)</sub> Temperature Coefficient	ΔV <sub>GS(th)</sub>		---	-4.0	---	mV/°C
Forward Transconductance	gfs	V <sub>DS</sub> =10V, I <sub>D</sub> =12A	---	20	---	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3, 4</sup>	Q <sub>g</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =15V, I <sub>D</sub> =20A	---	24	---	nC
Gate-Source Charge <sup>3, 4</sup>	Q <sub>gs</sub>		---	4.2	---	
Gate-Drain Charge <sup>3, 4</sup>	Q <sub>gd</sub>		---	13	---	
Turn-On Delay Time <sup>3, 4</sup>	T <sub>d(on)</sub>	V <sub>GS</sub> =10V, V <sub>DD</sub> =15V, R <sub>G</sub> =3.3Ω, I <sub>D</sub> =15A	---	12.6	---	ns
Rise Time <sup>3, 4</sup>	T <sub>r</sub>		---	19.5	---	
Turn-Off Delay Time <sup>3, 4</sup>	T <sub>d(off)</sub>		---	42.8	---	
Fall Time <sup>3, 4</sup>	T <sub>f</sub>		---	13.2	---	
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, F=1MHz	---	2200	---	pF
Output Capacitance	C <sub>oss</sub>		---	475	---	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	340	---	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	---	2.0	---	Ω
<b>Guaranteed Avalanche Energy</b>						
Single Pulse Avalanche Energy	EAS	V <sub>DD</sub> =25V, L=0.1mH, I <sub>AS</sub> =25A	31	---	---	mJ
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	I <sub>S</sub>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	90	A
Pulsed Source Current <sup>3</sup>	I <sub>SM</sub>		---	---	360	A
Diode Forward Voltage <sup>3</sup>	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =1A, T <sub>J</sub> =25°C	---	---	1.0	V
Reverse Recovery Time	t <sub>rr</sub>	V <sub>GS</sub> =30V, I <sub>S</sub> =1A, di/dt=100A/μs, T <sub>J</sub> =25°C	---	258	---	ns
Reverse Recovery Charge	Q <sub>rr</sub>		---	324	---	nC

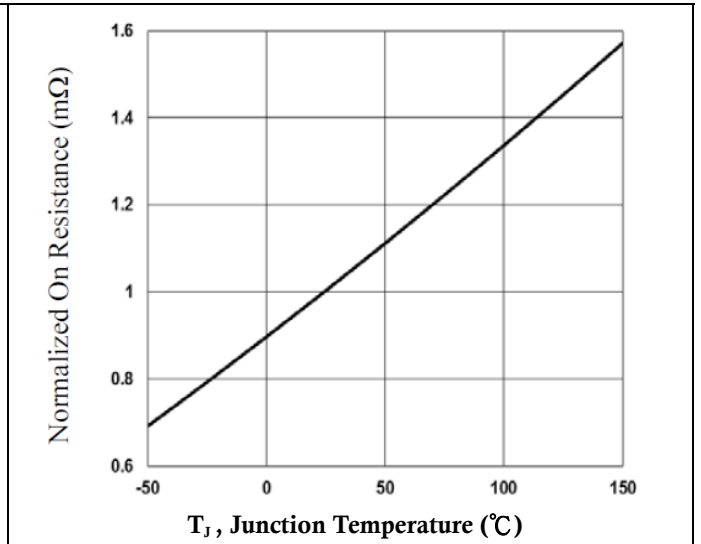
Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V<sub>GS</sub>=10V, V<sub>DD</sub>=25V, L=0.1mH, I<sub>AS</sub>=50A, R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C.
3. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

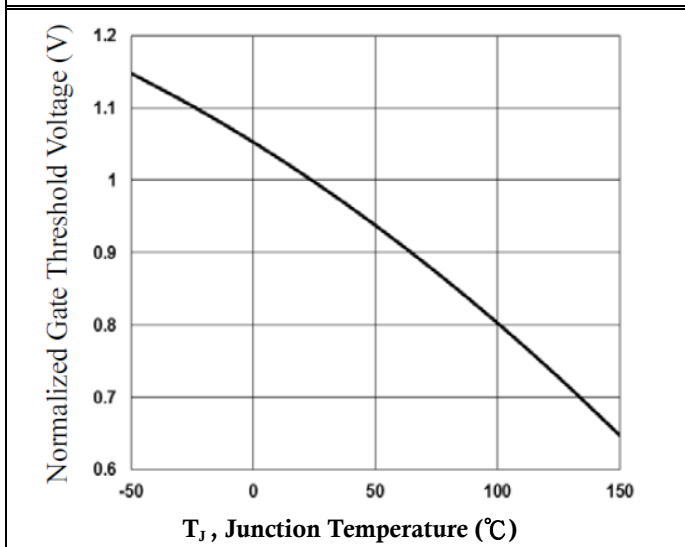
30V N-Channel MOSFETs



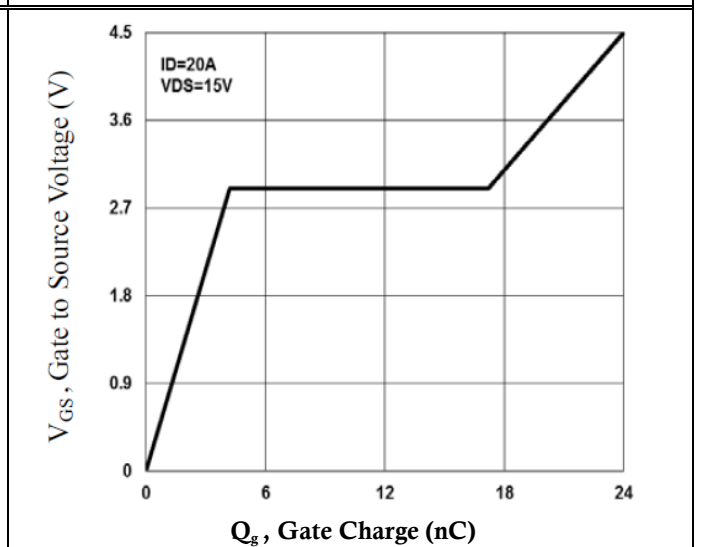
Continuous Drain Current vs.  $T_C$



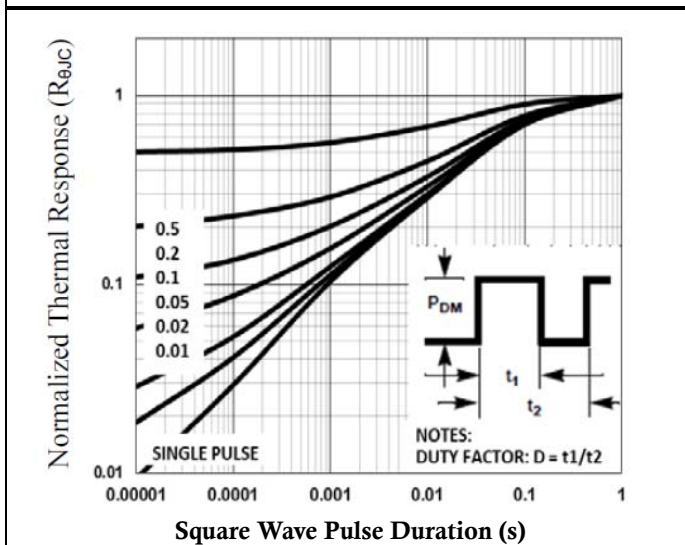
Normalized  $R_{DS(ON)}$  vs.  $T_J$



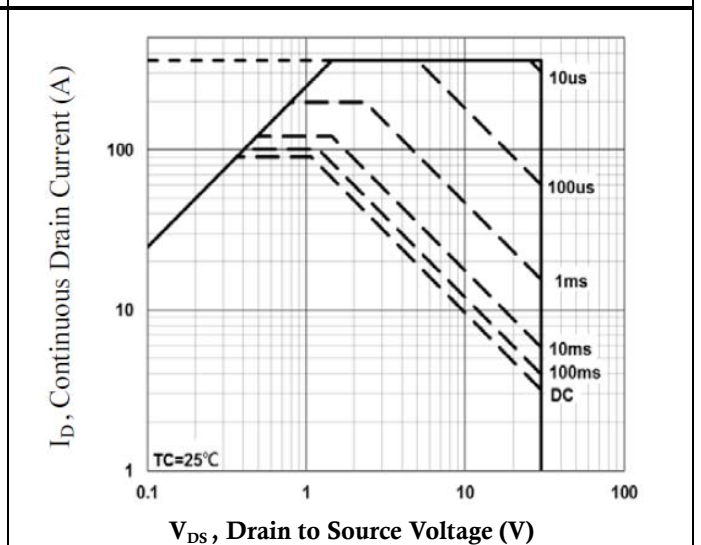
Normalized  $V_{th}$  vs.  $T_J$



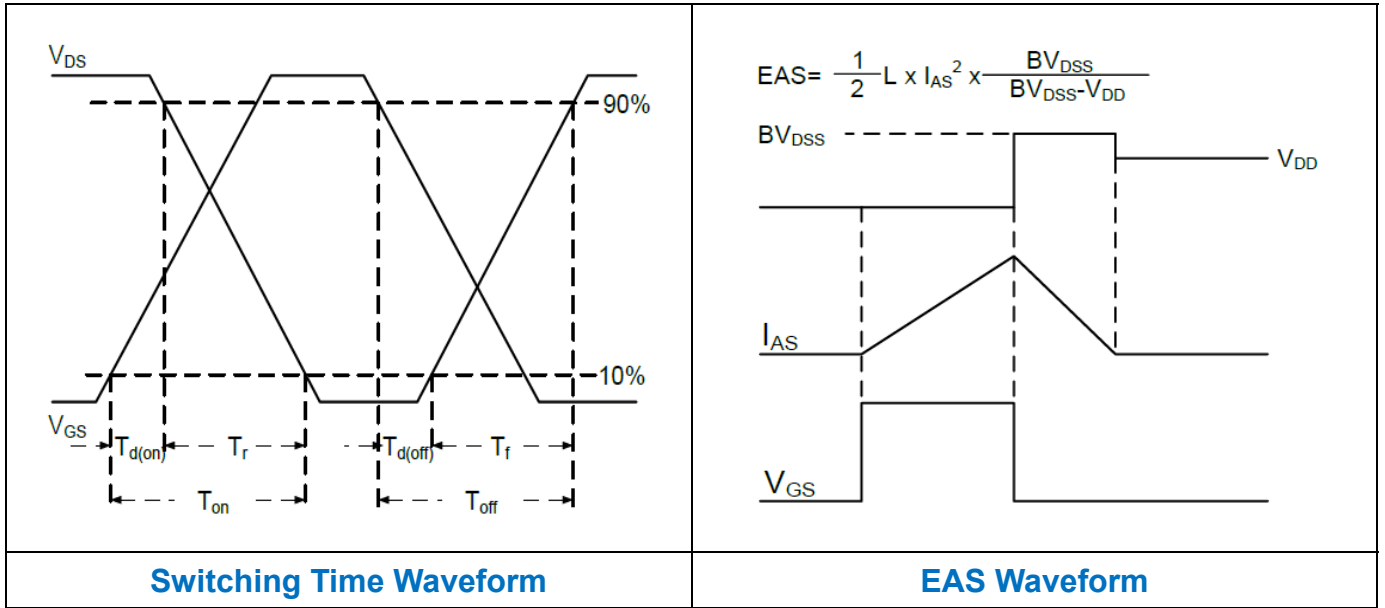
Gate Charge Waveform



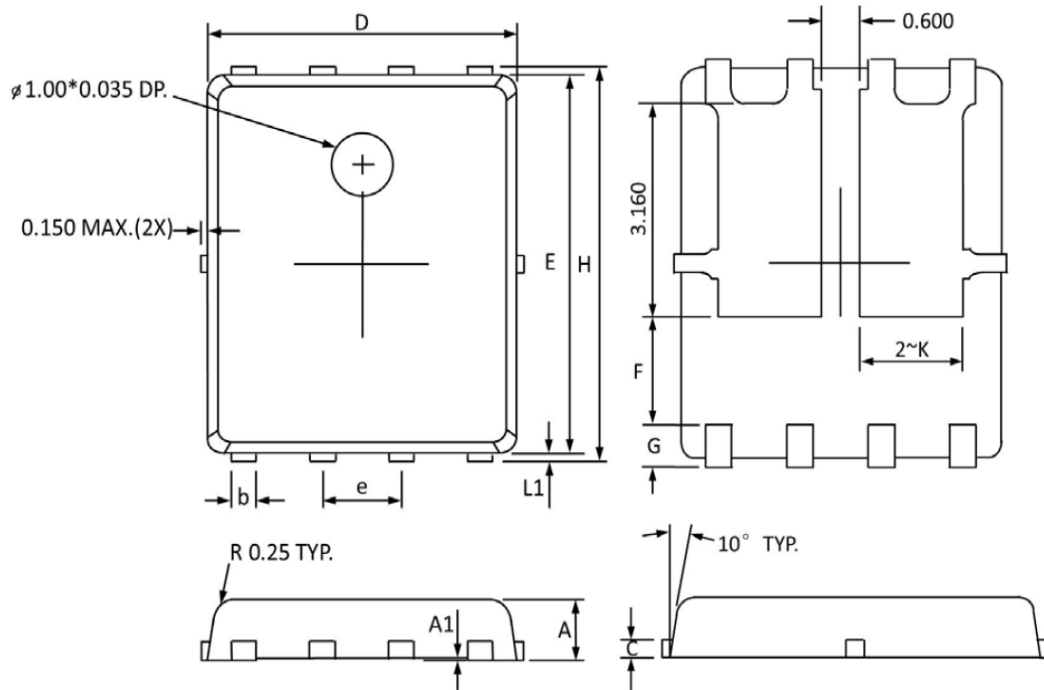
Normalized Transient Impedance



Maximum Safe Operation Area



PPAK5X6 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.000	0.800	0.039	0.032
A1	0.005	0.000	0.000	0.000
b	0.490	0.350	0.019	0.014
C	0.254(REF)		0.254(REF)	
D	5.100	4.900	0.200	0.193
E	5.900	5.700	0.232	0.225
e	1.270(BSC)		1.270(BSC)	
F	1.600(REF)		1.600(REF)	
G	0.600(REF)		0.600(REF)	
H	6.200	5.950	0.244	0.235
L1	0.180	0.100	0.007	0.004
K	1.600(REF)		1.600(REF)	