/ Descriptions

PDFN5×6A MOS

Complementary Enhancement MOSFET in a PDFN5 × 6A Plastic Package.

/ Features

N-channel	P-channel
V_{DS}(V)=30V	V_{DS}(V)=-30V
I_D=39.5A	I_D=-39A
$R_{DS(ON)}$<10m (V_{GS}=10V)	$R_{DS(ON)}$<12m (V_{GS}=-10V)
$R_{DS(ON)}$<15m (V_{GS}=4.5V)	$R_{DS(ON)}$<20m (V_{GS}=-4.5V)

AEC-Q101

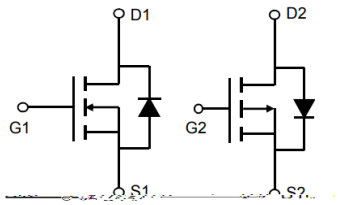
Qualified to AEC-Q101 Standards for High Reliability; HF Product.

/ Applications

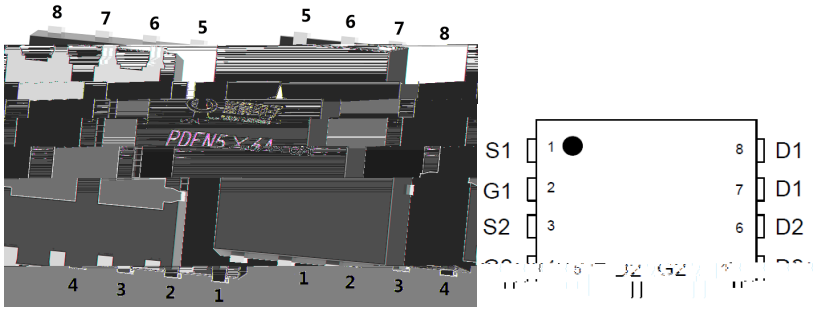
DC/DC

These devices are well suited for high efficiency switching DC/DC converters and switch mode power supplies. And suitable for use as a load switch or in PWM applications, Meet the stringent requirements of automotive applications.

/ Equivalent Circuit



/ Pinning



/ Marking

See Marking Instructions.

/ Absolute Maximum Ratings(T_a=25)

Parameter	Symbol	Rating		Unit
		N-channe	P-channell	
Drain-Source Voltage	V_{DSS}	±30		V
Gate-Source Voltage	V_{GSS}	±20		V
Continuous Drain Current	I_D (T_C=25)	39.5	-39	A
Pulsed Drain Current	I_{DM}	125	-125	A
Avalanche Current(L=0.5mH)	I_{AS}	17	13	A
Avalanche energy(L=0.5mH)	E_{AS}	115	67	mJ
Power Dissipation	P_D (T_C=25)	25	25	W
Junction and Storage Temperature Range	T_J,T_{STG}	-55 to +150		
Maximum Junction-to-Ambient	$R_{\Theta JA}$	65		/W
Maximum Junction-to-Case	$R_{\Theta JC}$	5		

N- /N-CHANNEL Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250 A	30	35		V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V V_{GS}=0V			1.0	A
Gate-Body leakage current	I_{GSS}	V_{GS}=±20V V_{DS}=0V			100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=250 A	1.0	1.6	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V I_D=10A		8	10	m
		V_{GS}=4.5V I_D=5A		12	15	m
Diode Forward Voltage	V_{SD}	V_{GS}=0V I_S=1.0A			1.2	V
Input Capacitance	C_{iss}	V_{DS}=25V V_{GS}=0V f=1.0MHz		930		pF
Output Capacitance	C_{oss}			100		pF
Reverse Transfer Capacitance	C_{rss}			70		pF
Gate resistance	R_g	V_{DS}=0V V_{GS}=0V f=1.0MHz		2.8		Ω
Total Gate Charge(10V)	Q_g	V_{GS}=10V V_{DS}=15V I_D=12A		14		nC
Total Gate Charge(4.5V)				6.5		nC
Gate-Source Charge	Q_{gs}			2.3		nC
Gate-Drain Charge	Q_{gd}			3		nC
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=15 V V_{GS}=10V R_L=1.25 R_{GEN}=3		4.5		ns
Turn-On Rise Time	t_r			10		ns
Turn-Off Delay Time	$t_{d(off)}$			15		ns
Turn-Off Fall Time	t_f			6		ns

N- / N-CHANNEL Electrical Characteristic Curve

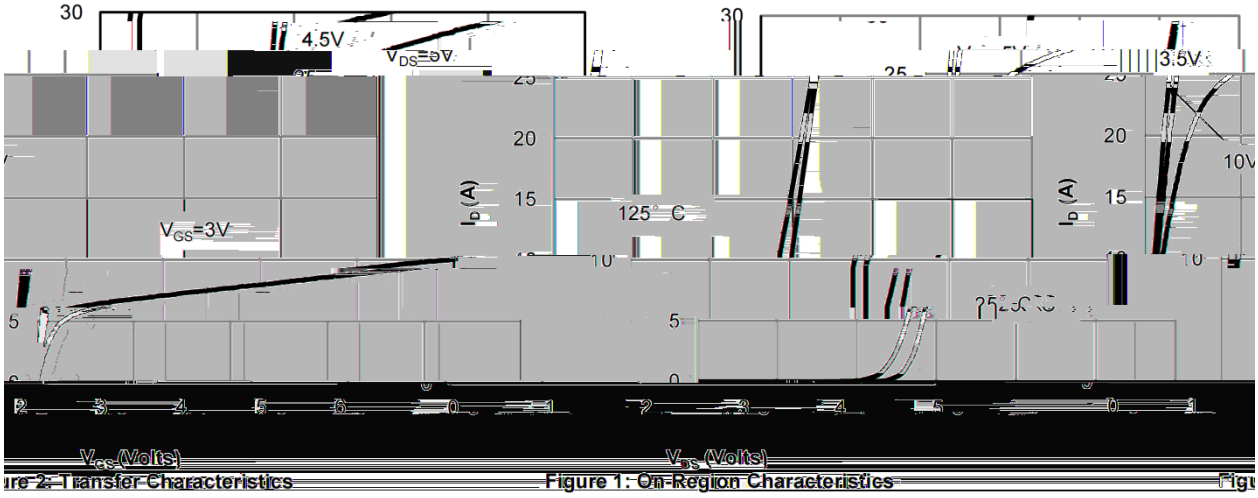


Figure 2: Transfer Characteristics Figure 1: On-Region Characteristics

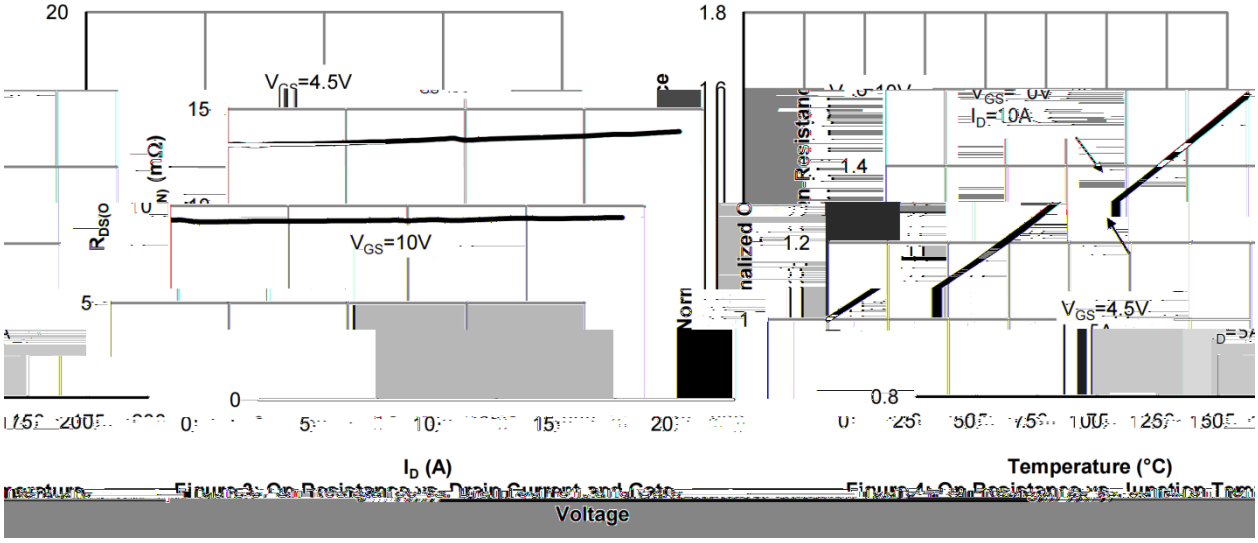
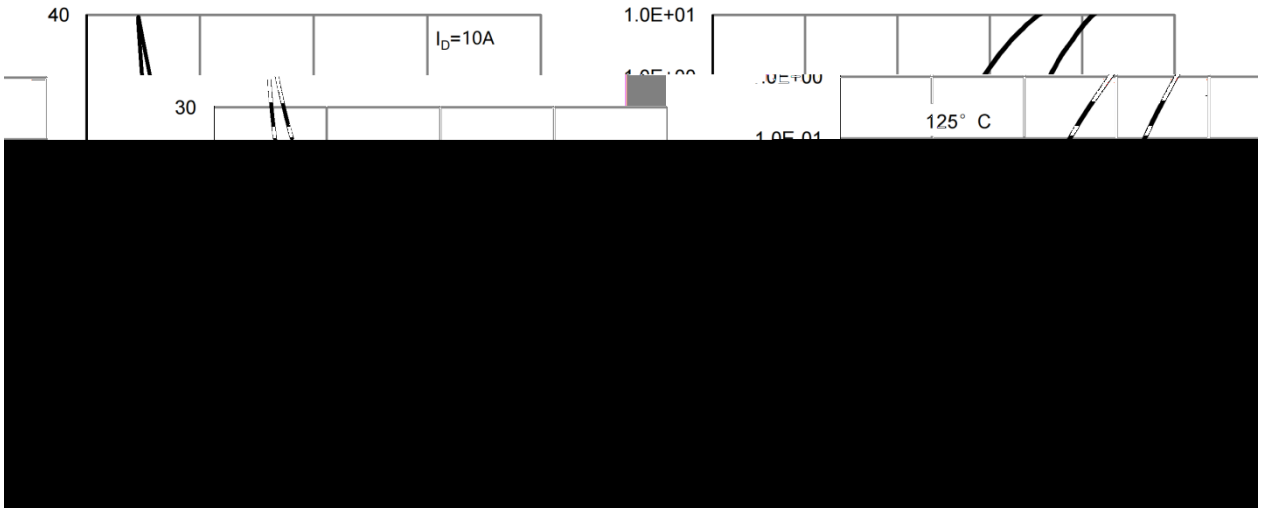


Figure 3: On-Resistance vs. Drain Current and Gate Voltage Figure 4: On-Resistance vs. Junction Temperature



N- / N-CHANNEL Electrical Characteristic Curve

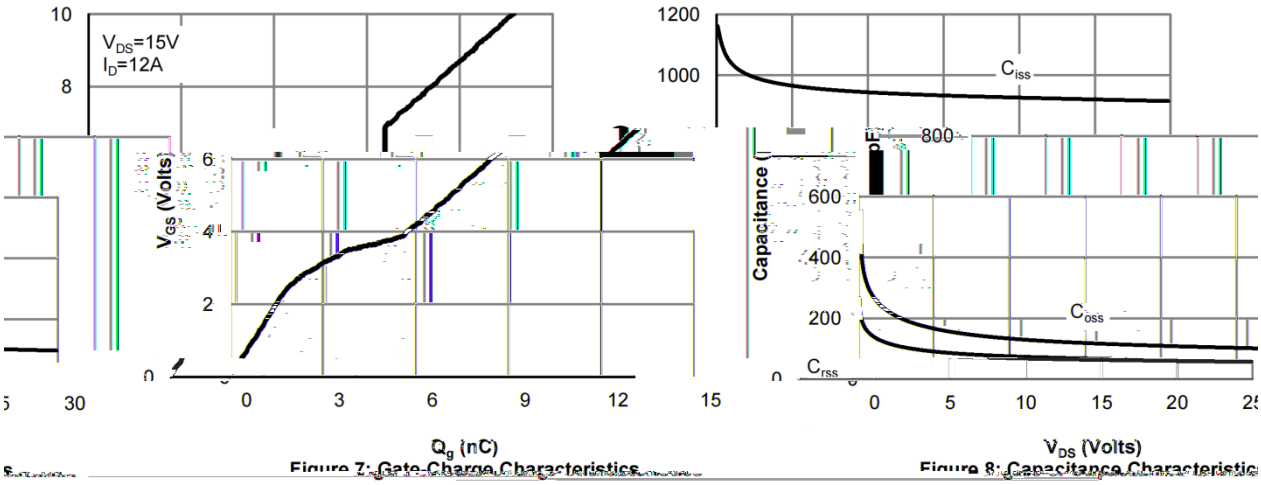
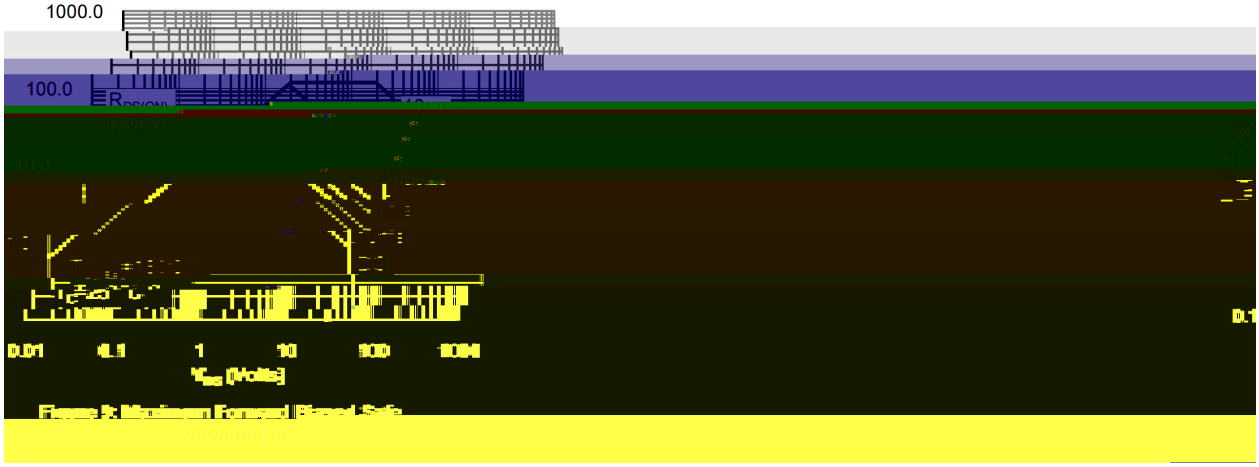


Figure 7: Gate-Charge Characteristics

Figure 8: Capacitance Characteristic



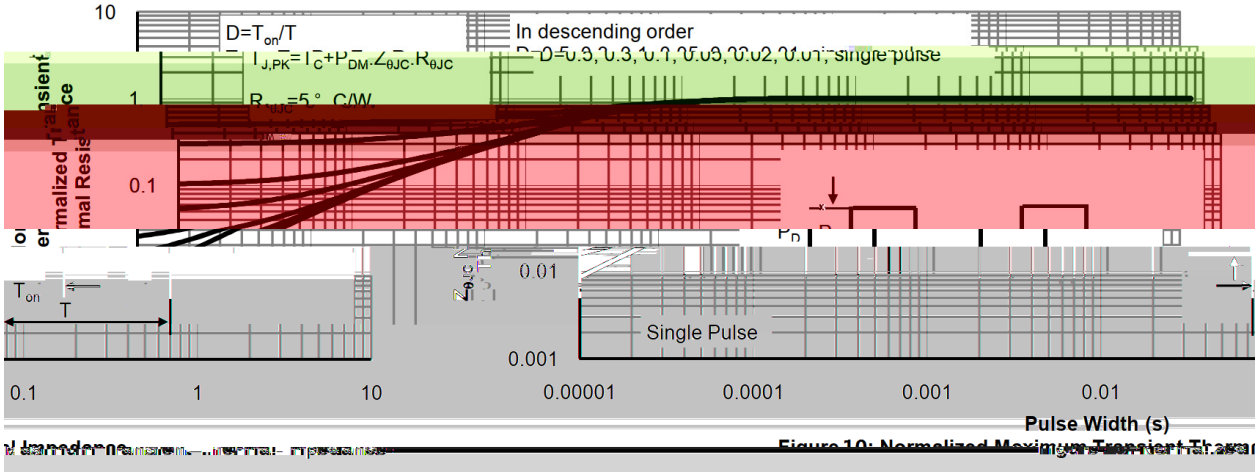


Figure 10: Normalized Maximum Transient Thermal

P- /P-CHANNEL Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250 A	-30	-37		V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V V_{GS}=0V			-1.0	A
Gate-Body leakage current	I_{GSS}	V_{GS}=±20V V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=-250 A	-1.0	-1.7	-2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=-10V I_D=-10A		10	12	m
		V_{GS}=-4.5V I_D=-5A		16	20	m
Diode Forward Voltage	V_{SD}	V_{GS}=0V I_S=-1.0A			-1.2	V
Input Capacitance	C_{iss}	V_{DS}=-25V V_{GS}=0V f=1.0MHz		3350		pF
Output Capacitance	C_{oss}			2400		pF
Reverse Transfer Capacitance	C_{rss}			1050		pF
Gate resistance	R_g	V_{DS}=0V V_{GS}=0V f=1.0MHz		6.8		Ω
Total Gate Charge(10V)	Q_g	V_{GS}=-10V V_{DS}=-15V I_D=-16A		36		nC
Total Gate Charge(4.5V)				16		nC
Gate-Source Charge	Q_{gs}			5.5		nC
Gate-Drain Charge	Q_{gd}			9		nC
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=-15 V V_{GS}=-10V R_L=0.9 R_{GEN}=3		11		ns
Turn-On Rise Time	t_r			7.4		ns
Turn-Off Delay Time	$t_{d(off)}$			44		ns
Turn-Off Fall Time	t_f			18		ns

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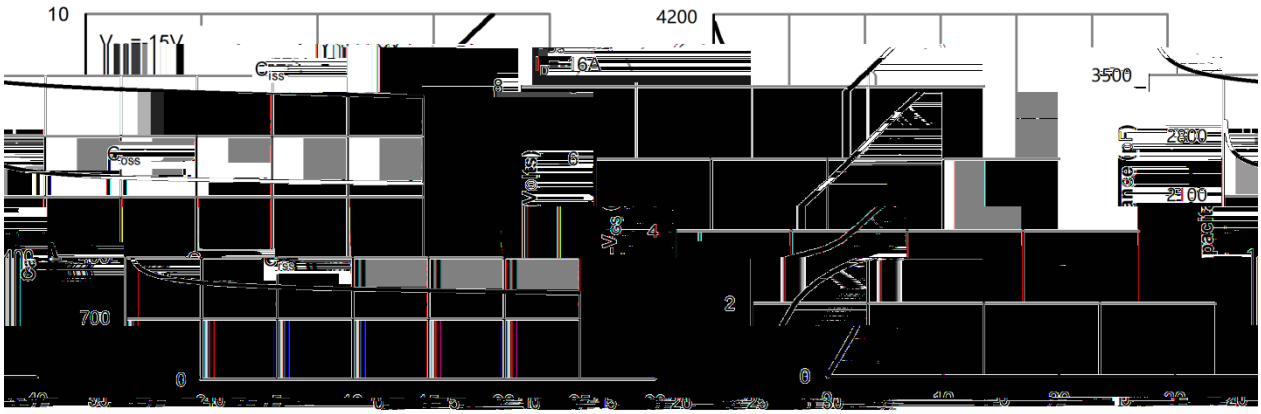
P- / P-CHANNEL Electrical Characteristic Curve

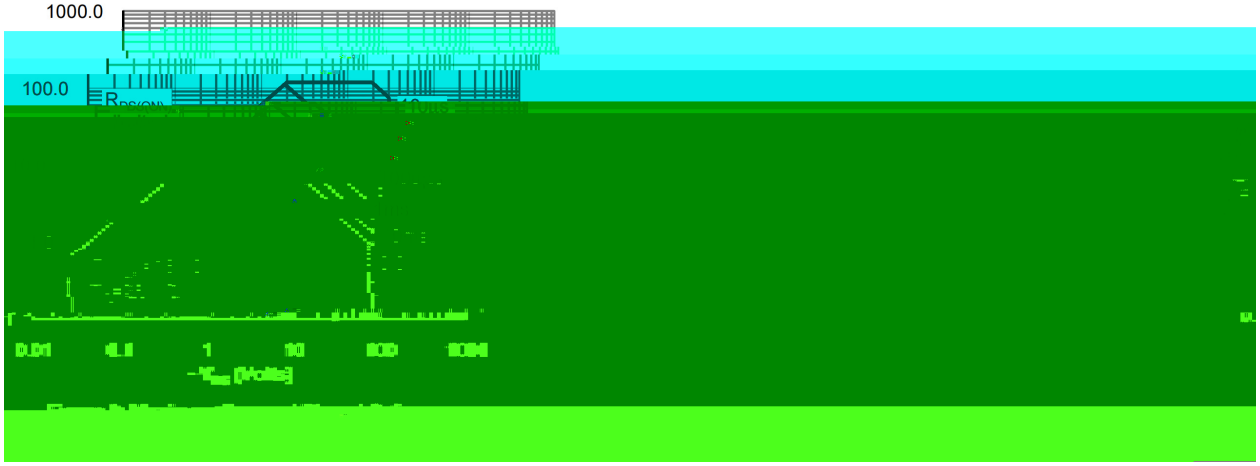


$-V_{DS}$ (Volts)

Figure 8: Capacitance Characteristics

Q_g (nC)

Figure 7: Gate Charge



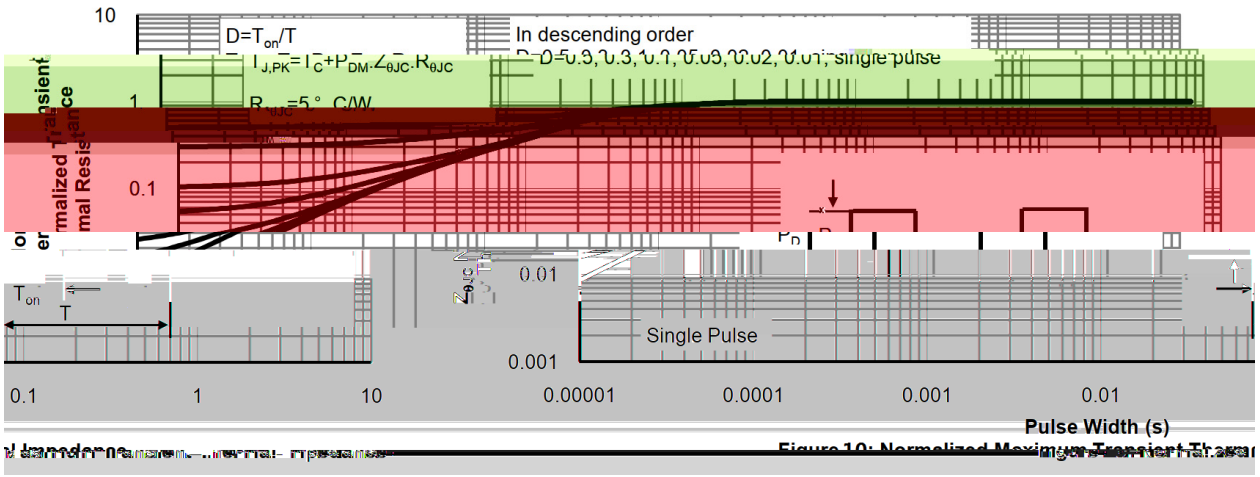
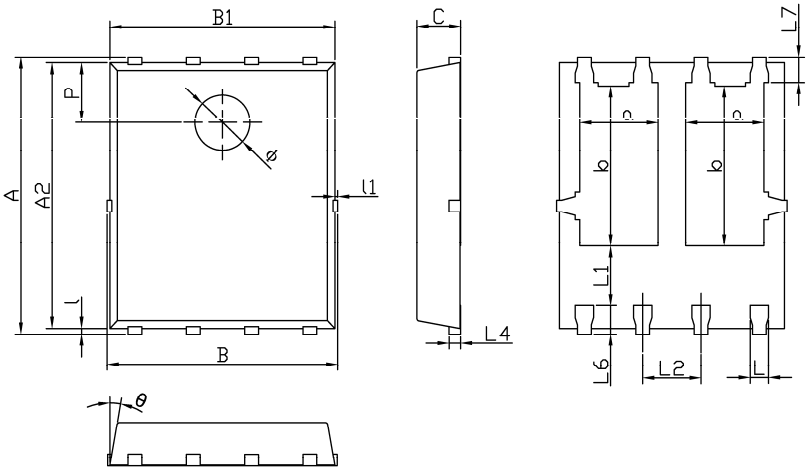


Figure 10: Normalized Maximum Transient Thermal

/ Package Dimensions

PDFN5X6A

Unit:mm



Dimensions In Millimeters			
Symbol	MIN	TYP	MAX
A	5.90	6.00	6.10
a	1.605	1.705	1.805
A2	5.70	5.75	5.80
B	4.90	5.00	5.10
b	3.375	3.475	3.575
B1	4.80	4.90	5.00
C	0.90	0.95	1.00
L	0.30	0.40	0.50
l	0.06	0.13	0.20
L1	1.10	–	–
l1	–	–	0.10
L2	1.17	1.27	1.37
L4	0.21	0.26	0.34
L6	0.51	0.61	0.71
L7	0.45	0.55	0.65
P	1.15	1.30	145
θ	8°	10°	12°
ϕ	1.10	1.20	1.30

Rev.01 202209

/ Marking Instructions

BR	
Q	
080C03	
****	
Note	
BR	Company Code
Q:	Automobile halogen-free product Code
080C03	Product Type Code
****:	Lot No. Code, code change with Lot No

( ) / Temperature Profile for IR Reflow Soldering(Pb-Free)

Note:

1	150 200 60 120sec;	1.Preheating:150~200 , Time:60~120sec.
2	255±5 5±0.5sec;	2.Peak Temp.:255±5 , Duration:5±0.5sec.
3	2 10 /sec.	3. Cooling Speed: 2~10 /sec.

/ Resistance to Soldering Heat Test Conditions

260±5 10±1 sec. Temp.:260±5 Time:10±1 sec

/ Packaging SPEC.

/ REEL

Package Type	Units					Dimension		(unit mm³)
	Units/Reel /	Reels/Inner Box /	Units/Inner Box /	Inner Boxes/Outer Box /	Units/Outer Box /	Reel	Inner Box	Outer Box
PDFN5×6A	5,000	2	10,000	6	60,000	13''×12	360×360×50	380×335×366