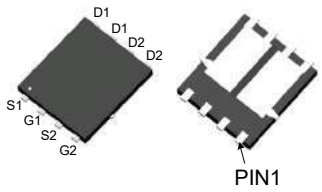
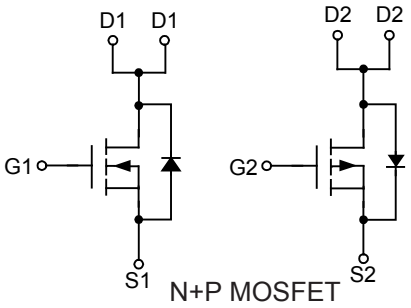
■ PRODUCT CHARACTERISTICS

N-Channel	P-Channel
BV_{DSS} = 30V	BV_{DSS}
$R_{DS(on)}$ (Typ@VGS=10V) < 17mΩ	$R_{DS(on)}$(Typ@VGS= -10V) < 32m
$R_{DS(on)}$ (Typ@VGS=4.5V) < 22mΩ	$R_{DS(on)}$(Typ@VGS=-4.5V)<45.5m
I_D=6A	I_D=-6A



■ APPLICATIONS

* Power management in computing
* Load switching,quick/wireless charging
* Motor driving



■ FEATURES

* Ultra low Rdson
* Low gate charge
* Pb-free lead plating

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen- Free	Halogen		
N/A	MOT3650J	PDFN3X3	5000 pieces/Reel

■ ABSOLUTE MAXIMUM RATINGS (T_J=25°C Unless Otherwise Noted)

Parameter		Symbol	Symbol		Unit
			N-channel	P-channel	
Drain-Source Voltage		V_{DS}	30	-30	V
Gate-Source Voltage		V_{GS}	±20	±20	V
Continuous Drain Current	T_A=25℃	I_D	6	-6	A
	T_A=70℃	I_D	5	-5	A
Pulsed Drain Current		I_{DM}	24	-24	A
Maximum Power Dissipation		P_D	2	2	W
Thermal Resistance,Junction-to-Ambient		$R_{\theta JA}$	62.5	62.5	℃/W
Operating Junction and Storage Temperature Range		T_J,T_{STG}	-55 To 150	-55 To 150	℃

-55 To 150 -55 To 150

■ N-ELECTRICAL CHARACTERISTICS (T_C=25℃ unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	30	33	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1	1.6	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=6A	-	17	25	mΩ
		V_{GS}=4.5V, I_D=6A	-	22	30	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=6A	15	-	-	S
Dynamic characteristics						
Input Capacitance	C_{lss}	V_{DS}=15V,V_{GS}=0V, F=1.0MHz	-	575	-	PF
Output Capacitance	C_{oss}		-	75	-	PF
Reverse Transfer Capacitance	C_{rss}		-	66.5	-	PF
Switching characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=15V, R_L=2.5Ω V_{GS}=10V,R_{GEN}=3Ω	-	4.5	-	nS
Turn-on Rise Time	t_r		-	2.5	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	14.5	-	nS
Turn-Off Fall Time	t_f		-	3.5	-	nS
Total Gate Charge	Q_g	V_{DS}=15V,I_D=6A, V_{GS}=10V	-	14.8	-	nC
Gate-Source Charge	Q_{gs}		-	2.6	-	nC
Gate-Drain Charge	Q_{gd}		-	2.9	-	nC
Drain-source diode characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=6A	-	0.8	1.2	V

■ P-ELECTRICAL CHARACTERISTICS (T_C=25℃ unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	-30	-33	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-30V,V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-1.3	-1.65	-2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-6A	-	32	39	mΩ
		V_{GS}=-4.5V, I_D=-6A	-	45.5	51	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-6A	10	-	-	S
Dynamic characteristics						
Input Capacitance	C_{lss}	V_{DS}=-15V,V_{GS}=0V, F=1.0MHz	-	575	-	PF
Output Capacitance	C_{oss}		-	75	-	PF
Reverse Transfer Capacitance	C_{rss}		-	66	-	PF
Switching characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-15V, R_L=2.5Ω V_{GS}=-10V,R_{GEN}=6Ω	-	7.5	-	nS
Turn-on Rise Time	t_r		-	5.5	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	19	-	nS
Turn-Off Fall Time	t_f		-	7	-	nS
Total Gate Charge	Q_g	V_{DS}=-15V,I_D=-6A V_{GS}=-10V	-	11.1	-	nC
Gate-Source Charge	Q_{gs}		-	2.0	-	nC
Gate-Drain Charge	Q_{gd}		-	2.6	-	nC
Drain-source diode characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=-6A	-	-	-1.2	V

■ N-TYPICAL CHARACTERISTICS

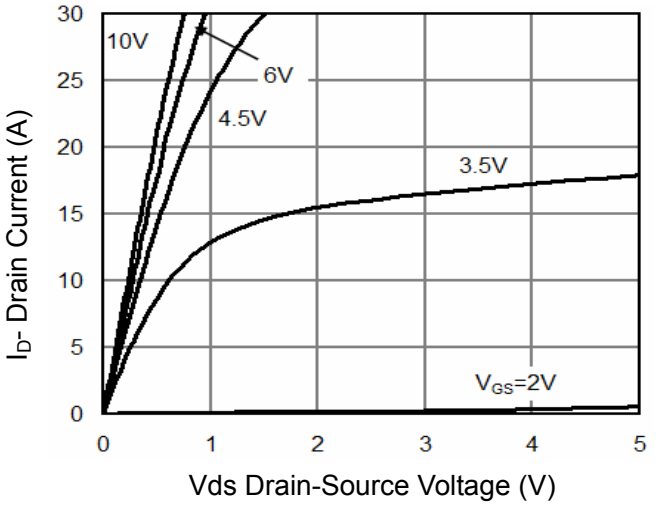


Figure 1:output chatracteristics

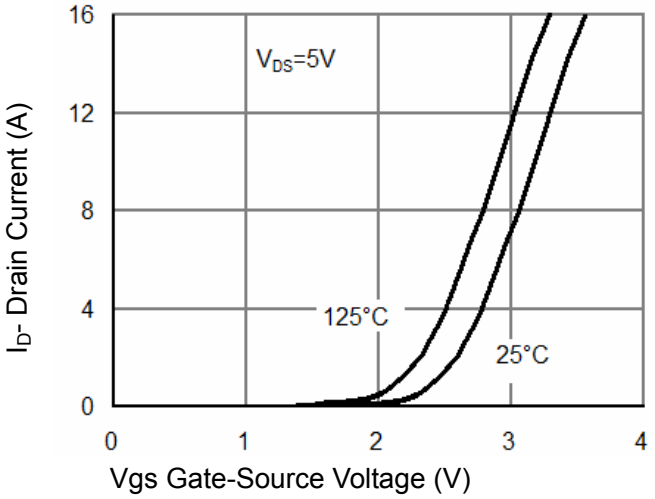


Figure 2:transfer characteristics

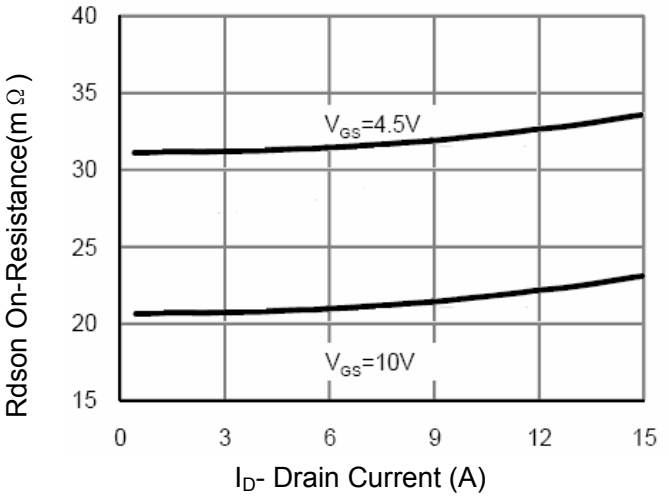


Figure 3:drain-source on-resistance

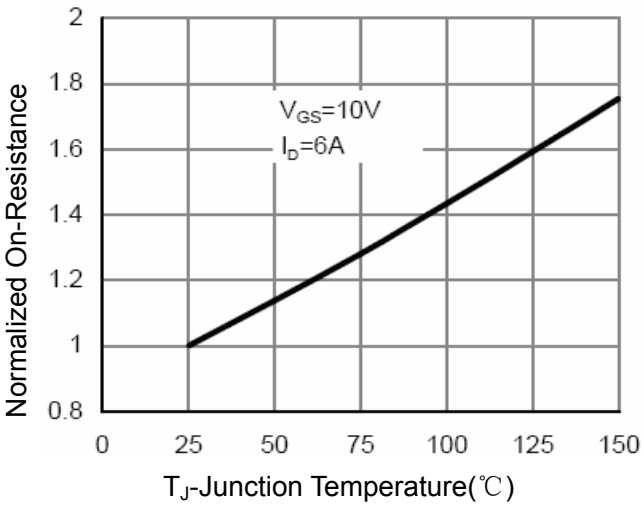


Figure 4:rdson-junction temperature

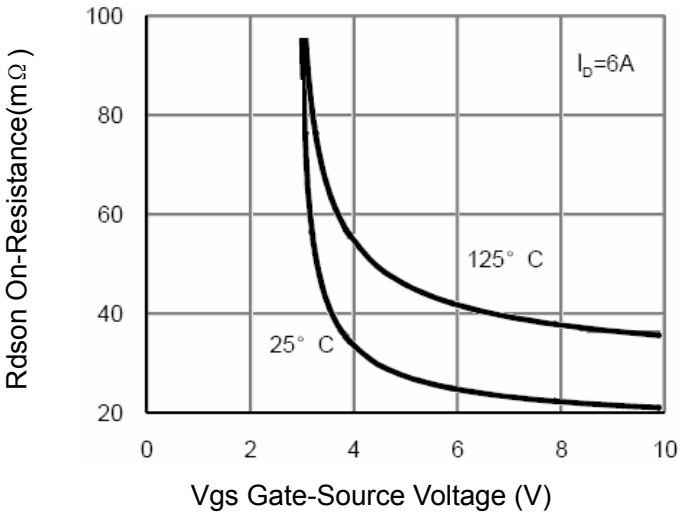


Figure 7:rdson vs vgs

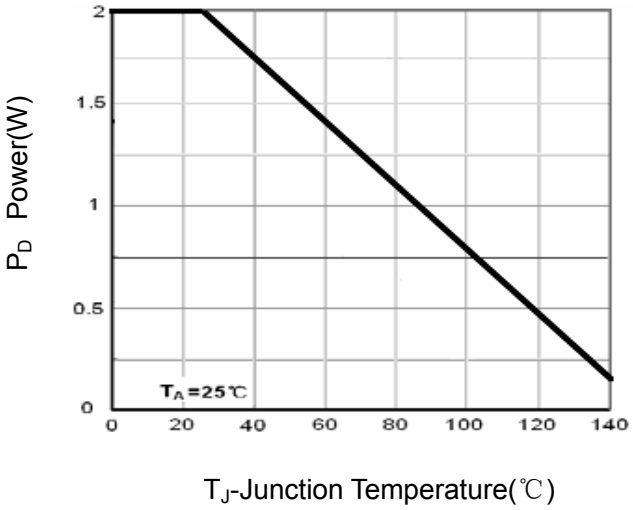


Figure 8:power dissipation

■ N-TYPICAL CHARACTERISTICS(Cont.)

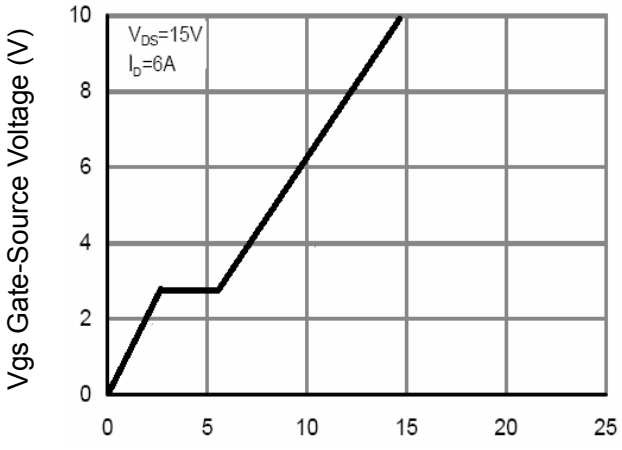


Figure 7:gate charge

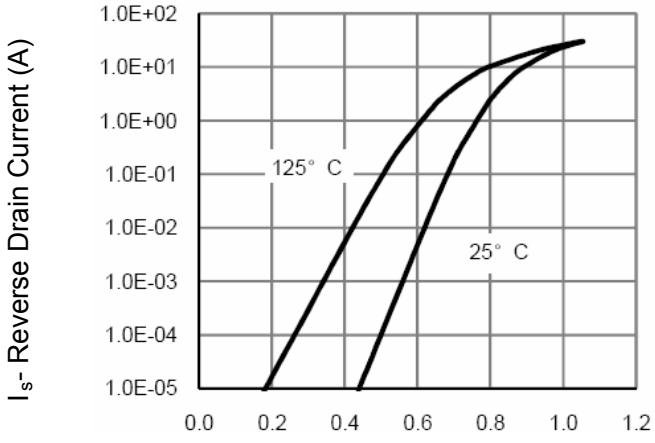


Figure 8:Sourceidrain-diode forward

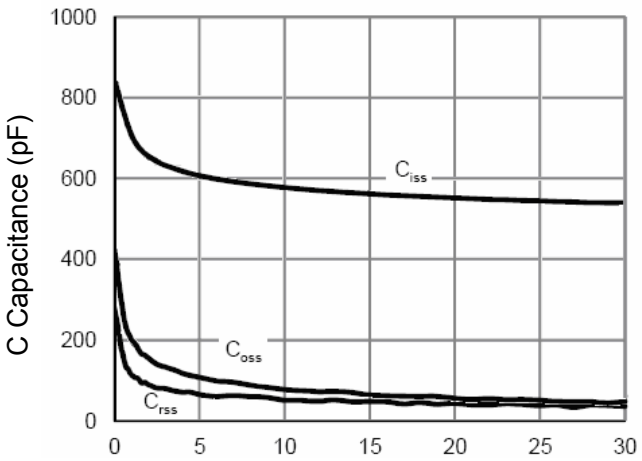


Figure 9:capacitance vs vds

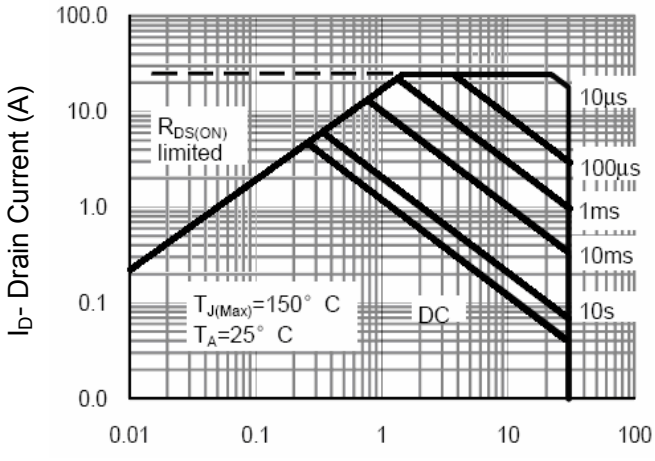


Figure 10:safe operation area

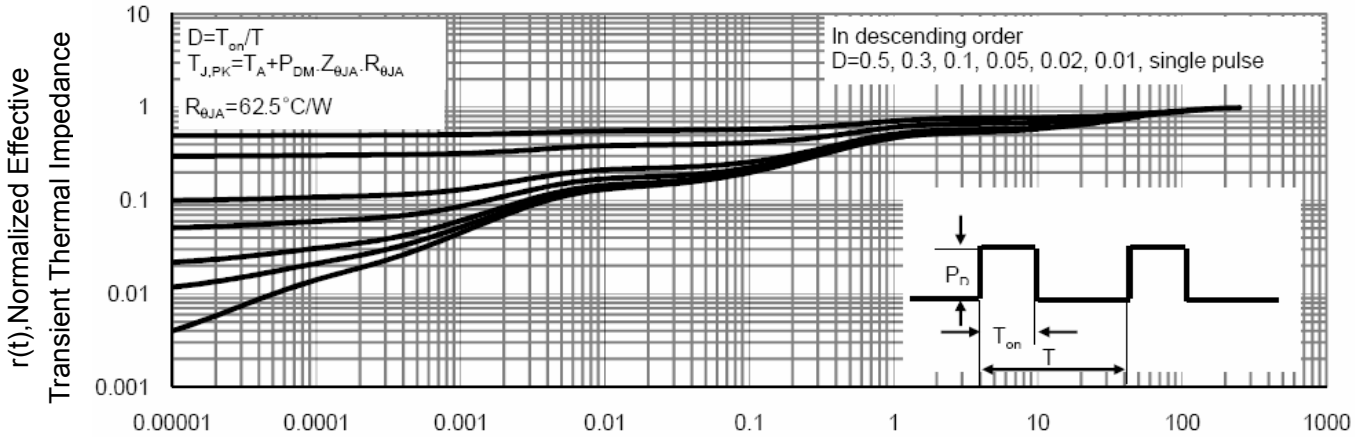


Figure 11: normalized maximum transient thermal impedance

■ P-TYPICAL CHARACTERISTICS

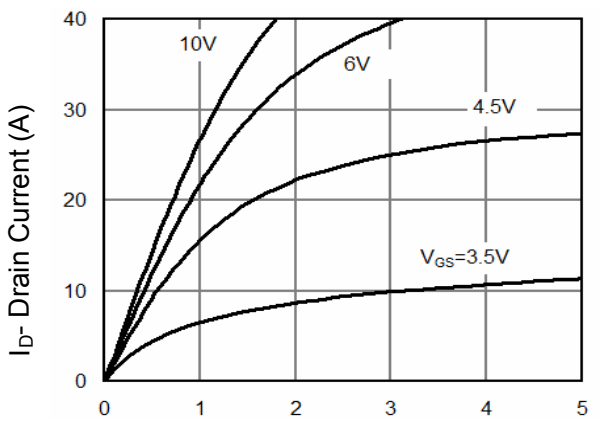


Figure 1:output characteristics

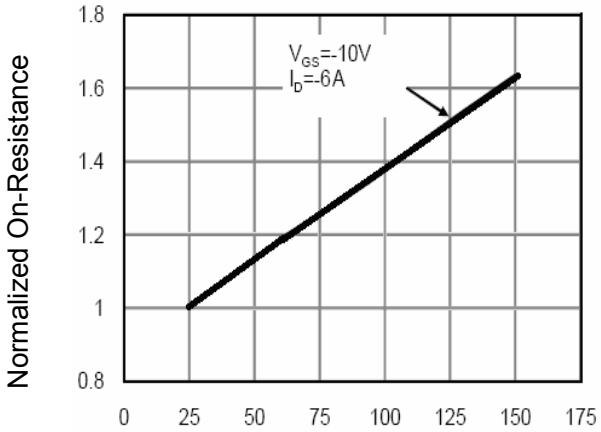


Figure 2:rdson-junction temperature

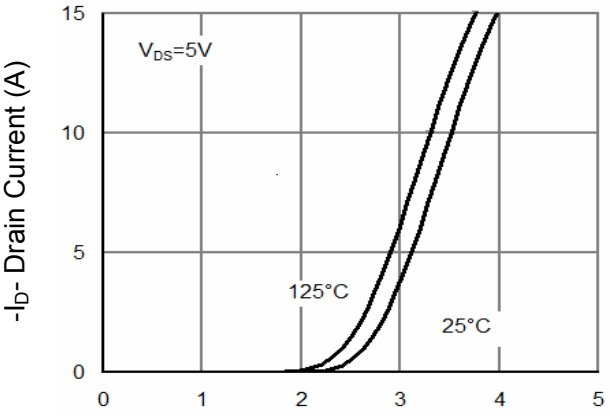


Figure 3:transfer characteristics

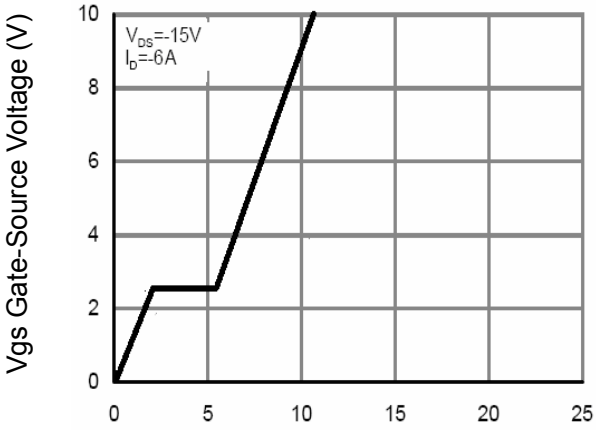


Figure 4:gate charge

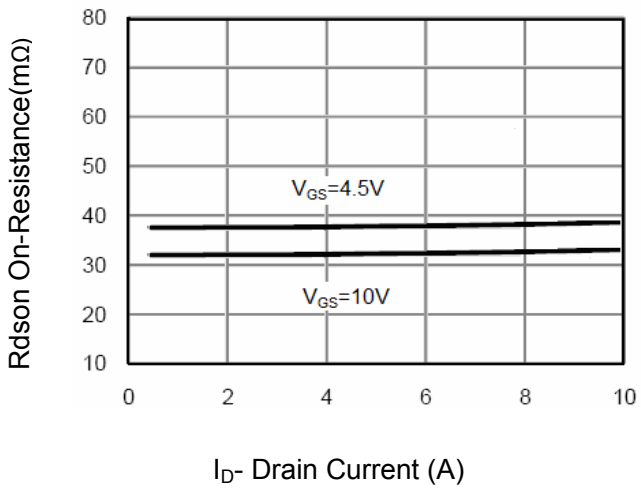


Figure 5:rdson-drain current

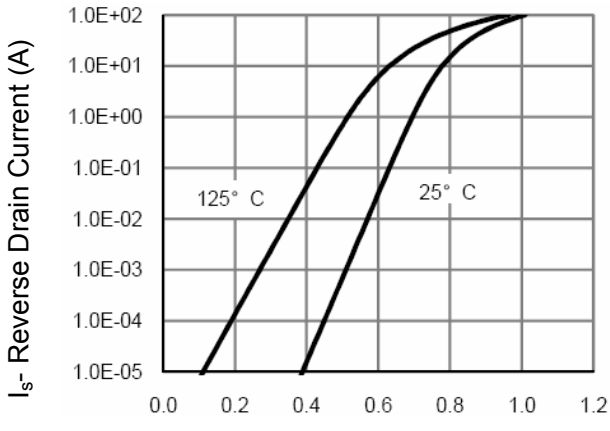


Figure 6:source-drain diode forward

■ P-TYPICAL CHARACTERISTICS(Cont.)

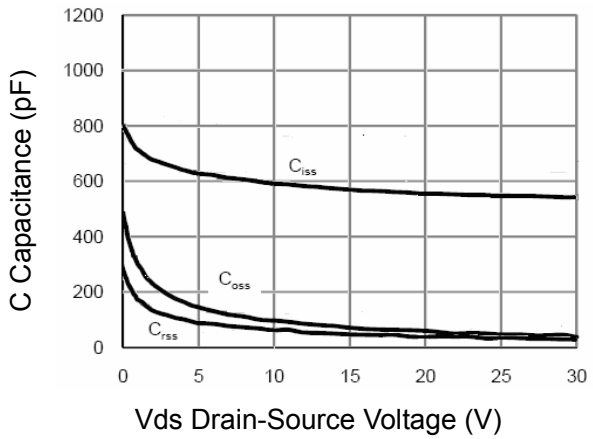


Figure 7:capacitance vs vds

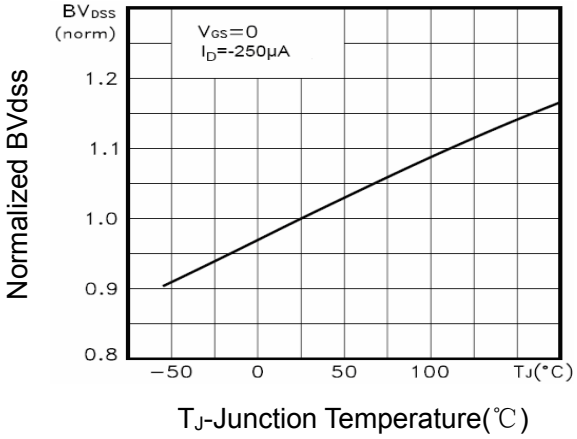


Figure 8:bvdss vs junction temperature

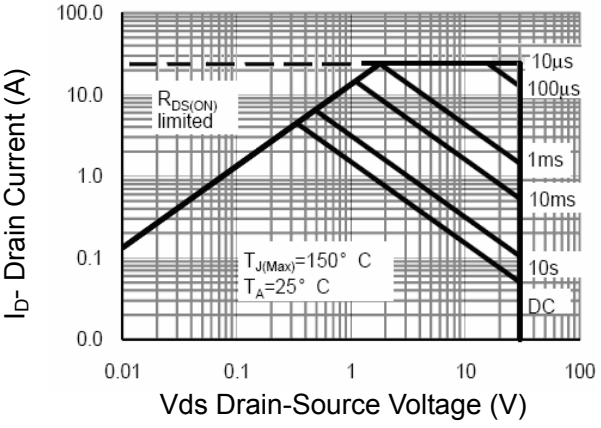


Figure 9:safe operation area

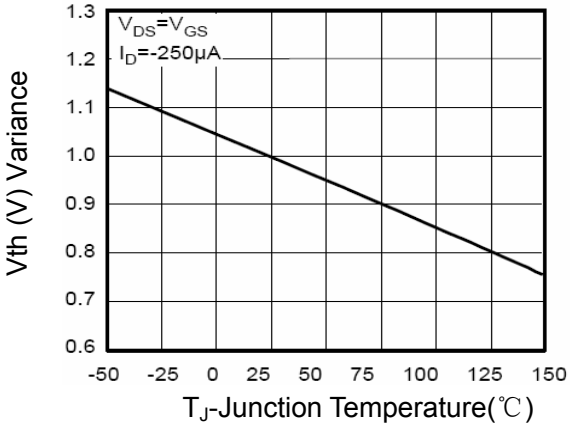


Figure 10:vgs(th) vs junction temperature

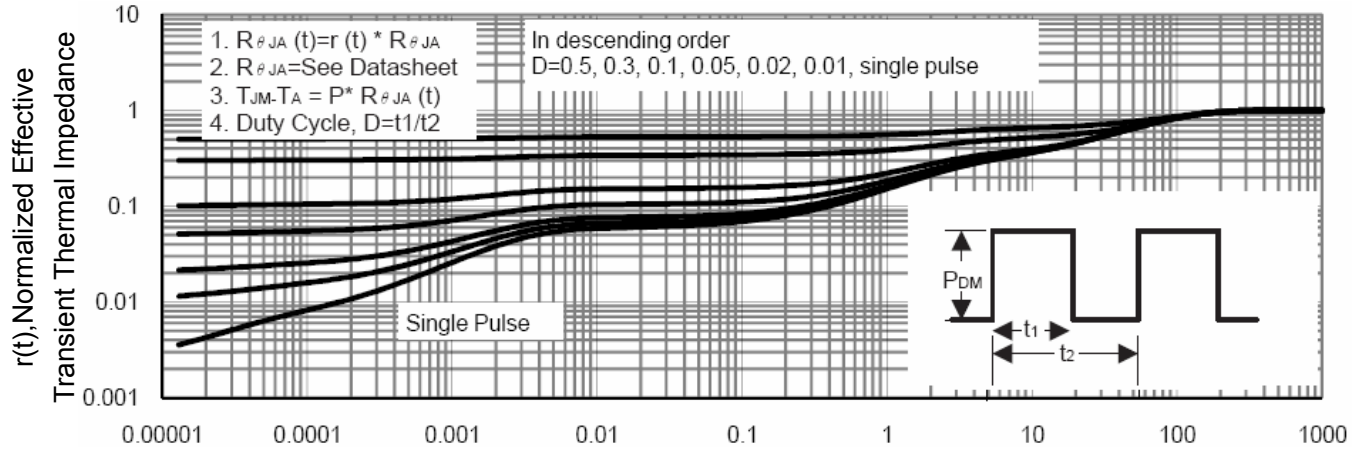
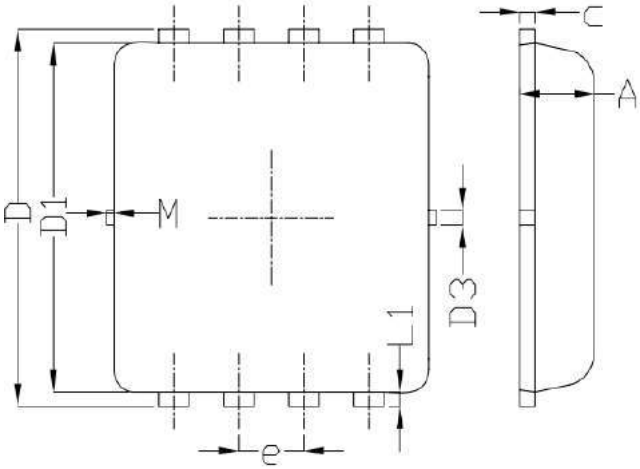
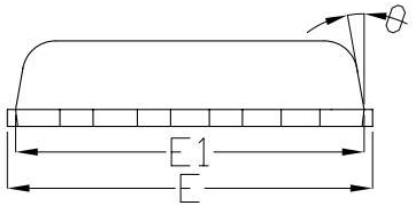
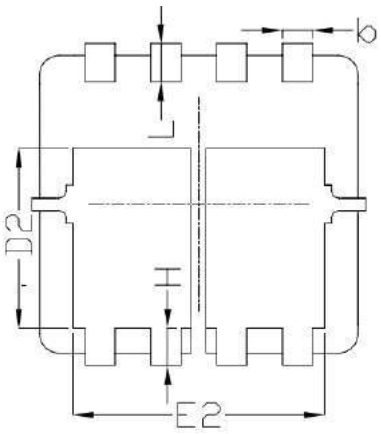


Figure11:normalized maximum transient thermal impedance

■ PDFN3X3-8L Package Mechanical Data







SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	---	0.13	---
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	---	0.13	---
θ	---	10°	12°
M	*	*	0.15
* Not specified			