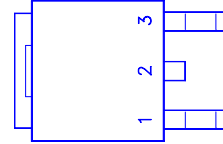
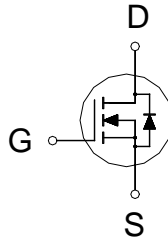


PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
20	14m	45A



1. GATE
2. DRAIN
3. SOURCE

ABSOLUTE MAXIMUM RATINGS ($T_C = 25\text{ }^\circ\text{C}$ Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Gate-Source Voltage		V_{GS}	± 12	V
Continuous Drain Current	$T_C = 25\text{ }^\circ\text{C}$	I_D	45	A
	$T_C = 100\text{ }^\circ\text{C}$		30	
Pulsed Drain Current ¹		I_{DM}	140	
Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	P_D	48	W
	$T_C = 100\text{ }^\circ\text{C}$		20	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	$^\circ\text{C}$
Lead Temperature (¹ / ₁₆ " from case for 10 sec.)		T_L	275	

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		2.6	$^\circ\text{C} / \text{W}$
Junction-to-Ambient	$R_{\theta JA}$		110	

¹Pulse width limited by maximum junction temperature.

²Duty cycle $\leq 1\%$

ELECTRICAL CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$	20			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	0.45	0.75	1.25	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{V}, V_{GS} = \pm 12\text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 16\text{V}, V_{GS} = 0\text{V}$			1	μA
		$V_{DS} = 13.2\text{V}, V_{GS} = 0\text{V}, T_J = 125\text{ }^\circ\text{C}$			10	
On-State Drain Current ¹	$I_{D(ON)}$	$V_{DS} = 5\text{V}, V_{GS} = 4.5\text{V}$	45			A
Drain-Source On-State Resistance ¹	$R_{DS(ON)}$	$V_{GS} = 2.5\text{V}, I_D = 9\text{A}$		18	26	m
		$V_{GS} = 5\text{V}, I_D = 18\text{A}$		11	14	
Forward Transconductance ¹	g_{fs}	$V_{DS} = 10\text{V}, I_D = 18\text{A}$		26		S

DYNAMIC						
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 15V, f = 1MHz$		500		pF
Output Capacitance	C_{oss}			310		
Reverse Transfer Capacitance	C_{rss}			125		
Total Gate Charge ²	Q_g	$V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = 5V,$ $I_D = 18A$		17		nC
Gate-Source Charge ²	Q_{gs}			1.5		
Gate-Drain Charge ²	Q_{gd}			10.5		
Turn-On Delay Time ²	$t_{d(on)}$	$V_{DS} = 10V,$ $I_D \cong 18A, V_{GS} = 5V, R_{GS} = 3.3$		7.5		nS
Rise Time ²	t_r			83		
Turn-Off Delay Time ²	$t_{d(off)}$			18		
Fall Time ²	t_f			23		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$)						
Continuous Current	I_S				45	A
Pulsed Current ³	I_{SM}				140	
Forward Voltage ¹	V_{SD}	$I_F = I_S, V_{GS} = 0V$			1.3	V
Reverse Recovery Time	t_{rr}	$I_F = I_S, di_F/dt = 100A / \mu S$		37		nS
Peak Reverse Recovery Current	$I_{RM(REC)}$			200		A
Reverse Recovery Charge	Q_{rr}			0.043		μC

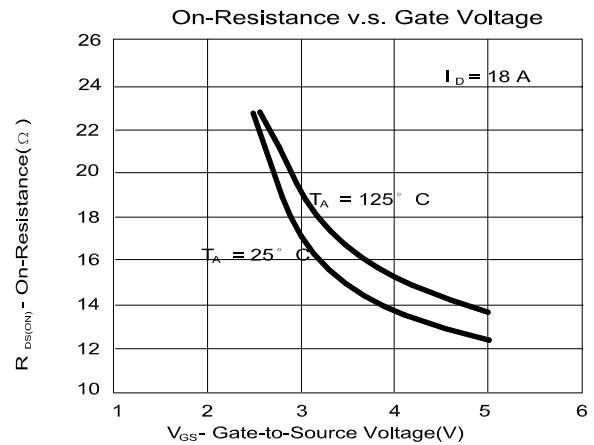
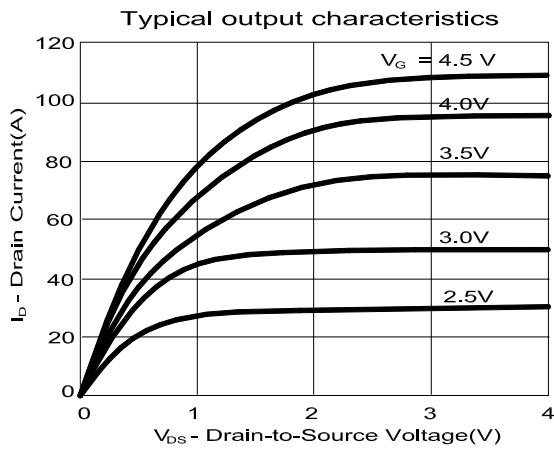
¹Pulse test : Pulse Width $\leq 300\ \mu\text{sec}$, Duty Cycle $\leq 2\%$.

²Independent of operating temperature.

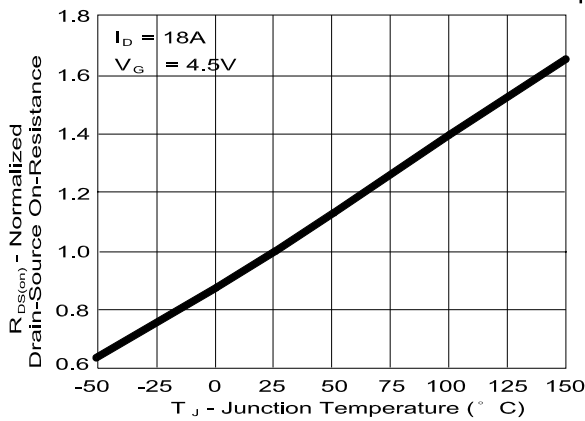
³Pulse width limited by maximum junction temperature.

REMARK: THE PRODUCT MARKED WITH "P1402CDG", DATE CODE or LOT #

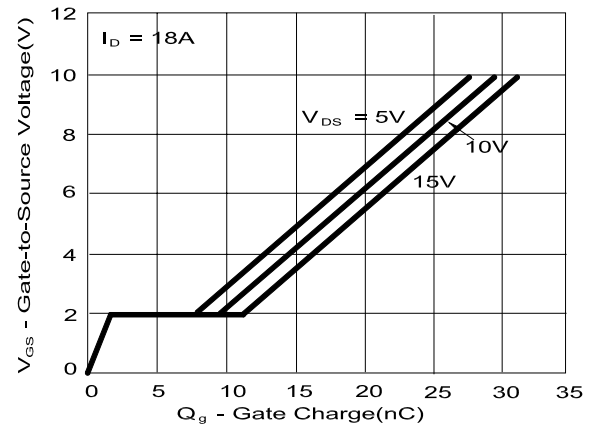
Orders for parts with Lead-Free plating can be placed using the PXXXXXXG parts name.



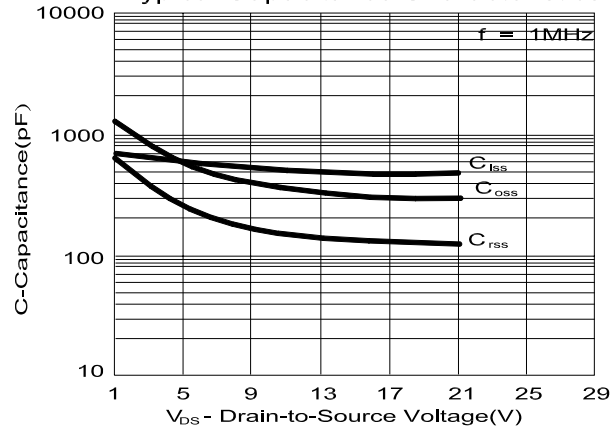
Normalized on-Resistance v.s. Junction Temperature



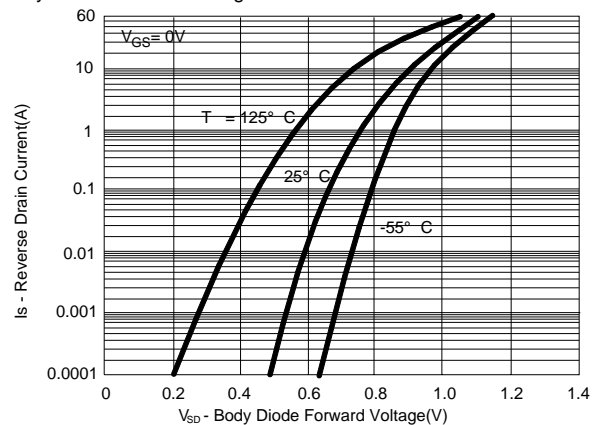
Gate Charge Characteristics



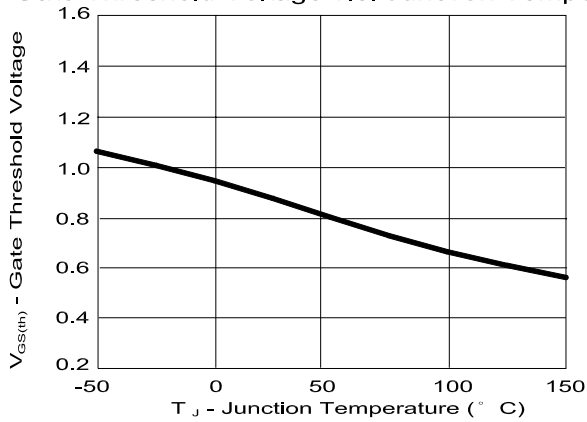
Typical Capacitance Characteristics



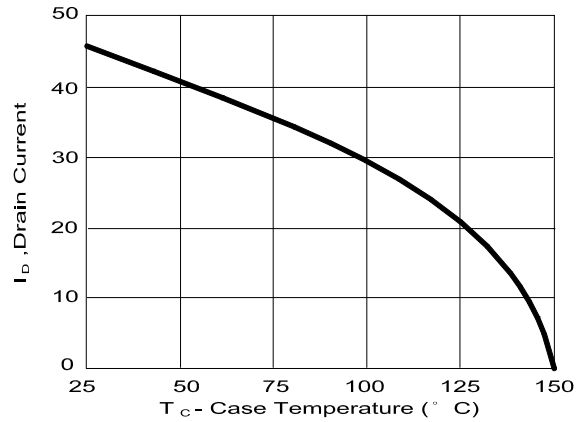
Body Diode Forward Voltage Variation with Source Current and Temperature



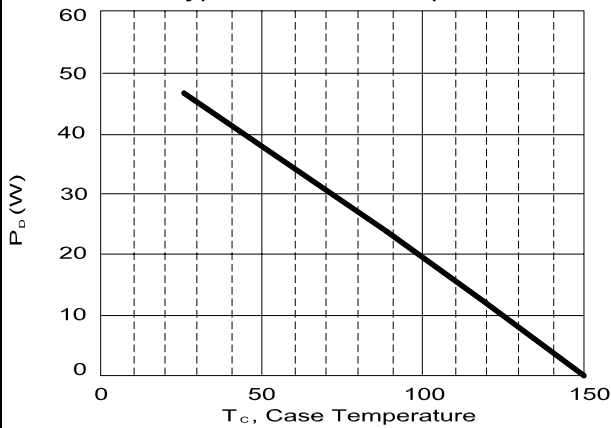
Gate Threshold Voltage v.s. Junction Temperature



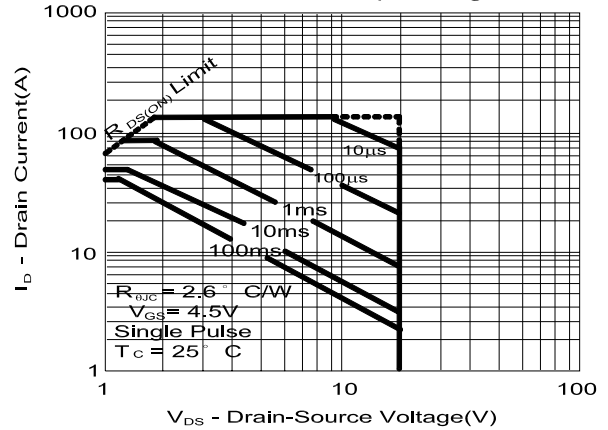
Maximum Drain Current v.s. Case Temperature



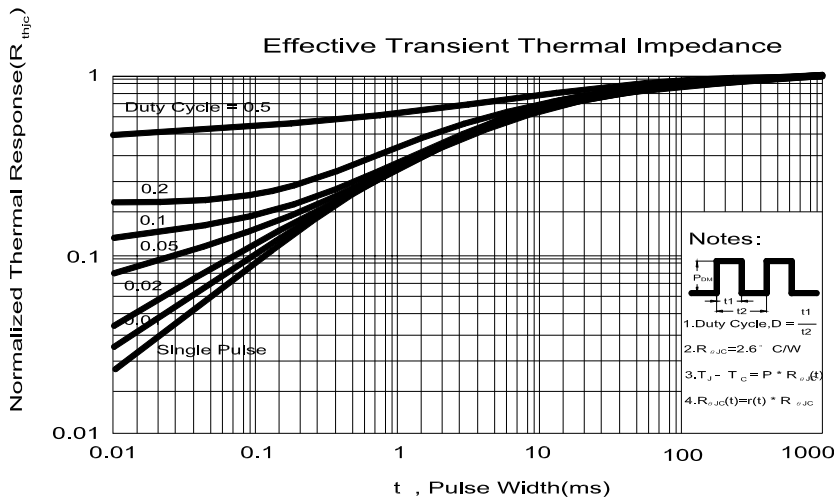
Typical Power Dissipation



Maximum Safe Operating Area



Effective Transient Thermal Impedance



Notes:



1. Duty Cycle, $D = \frac{t_1}{t_2}$
2. $R_{\theta(jc)} = 2.6 \text{ } ^\circ\text{C/W}$
3. $T_J - T_C = P \cdot R_{\theta(jc)}(t)$
4. $R_{\theta(jc)}(t) = (t) \cdot R_{\theta(jc)}$

TO-252 (DPAK) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	9.35		10.4	H	0.89		2.03
B	2.2		2.4	I	6.35		6.80
C	0.45		0.6	J	5.2		5.5
D	0.89		1.5	K	0.6		1
E	0.45		0.69	L	0.5		0.9
F	0.03		0.23	M	3.96	4.57	5.18
G	5.2		6.2	N			

