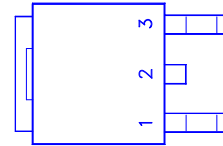
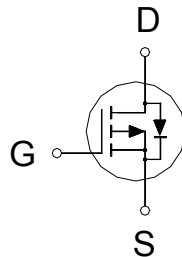


PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
-40V	25.8mΩ	-18A



- 1. GATE
- 2. DRAIN
- 3. SOURCE

**100% UIS tested
100% Rg tested**

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	-40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	$T_C = 25\text{ }^\circ\text{C}$	I_D	-18	A
	$T_C = 70\text{ }^\circ\text{C}$		-13.5	
Pulsed Drain Current ¹		I_{DM}	-40	
Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	P_D	42	W
	$T_C = 70\text{ }^\circ\text{C}$		27	
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	$R_{\theta JC}$		3	$^\circ\text{C} / \text{W}$
Junction-to-Ambient	$R_{\theta JA}$		75	$^\circ\text{C} / \text{W}$

¹Pulse width limited by maximum junction temperature.

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	$V_{(BR)DSS}$	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$	-40			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$	-1.5	-2.2	-3.0	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$			±250	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -32\text{V}, V_{GS} = 0\text{V}$			1	μA
		$V_{DS} = -30\text{V}, V_{GS} = 0\text{V}, T_J = 125\text{ }^\circ\text{C}$			10	
On-State Drain Current ¹	$I_{D(ON)}$	$V_{DS} = -5\text{V}, V_{GS} = -10\text{V}$	-40			A

Drain-Source On-State Resistance ¹	$R_{DS(ON)}$	$V_{GS} = -7V, I_D = -10A$	30	40	mΩ
		$V_{GS} = -10V, I_D = -18A$	22	25.8	
Forward Transconductance ¹	g_{fs}	$V_{DS} = -5V, I_D = -18A$	20		S
DYNAMIC					
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = -15V, f = 1MHz$	1570		pF
Output Capacitance	C_{oss}		320		
Reverse Transfer Capacitance	C_{rss}		210		
Total Gate Charge ²	Q_g	$V_{DS} = 0.5V_{(BR)DSS}, V_{GS} = -10V,$ $I_D = -18A$	29		nC
Gate-Source Charge ²	Q_{gs}		6		
Gate-Drain Charge ²	Q_{gd}		7		
Turn-On Delay Time ²	$t_{d(on)}$	$V_{DS} = -20V, R_L = 1\Omega$ $I_D \cong -1A, V_{GS} = -10V, R_{GS} = 6\Omega$	12		nS
Rise Time ²	t_r		29		
Turn-Off Delay Time ²	$t_{d(off)}$		42		
Fall Time ²	t_f		33		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_c = 25 °C)					
Continuous Current	I_S			-18	A
Forward Voltage ¹	V_{SD}	$I_F = I_S, V_{GS} = 0V$		-1.3	V
Reverse Recovery Time	t_{rr}	$I_F = -18A, di_F/dt = 100A / \mu S$	29		nS
Reverse Recovery Charge	Q_{rr}		21		nC

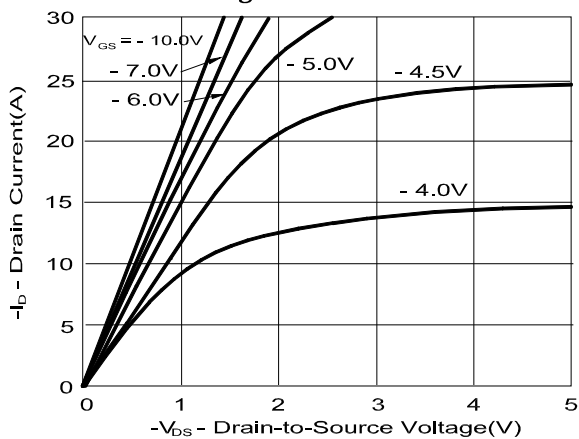
¹Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

²Independent of operating temperature.

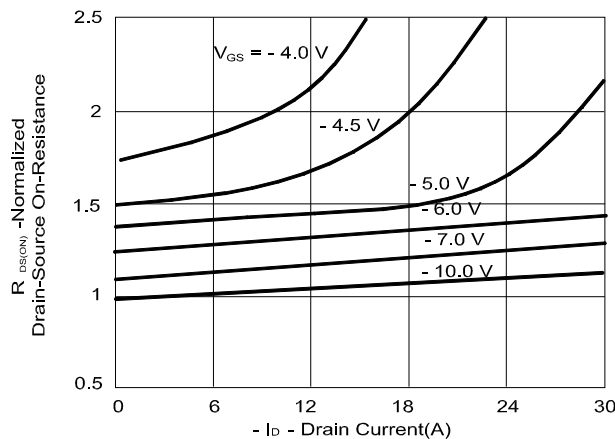
REMARK: THE PRODUCT MARKED WITH “P2504EDG”, DATE CODE or LOT #

TYPICAL PERFORMANCE CHARACTERISTICS

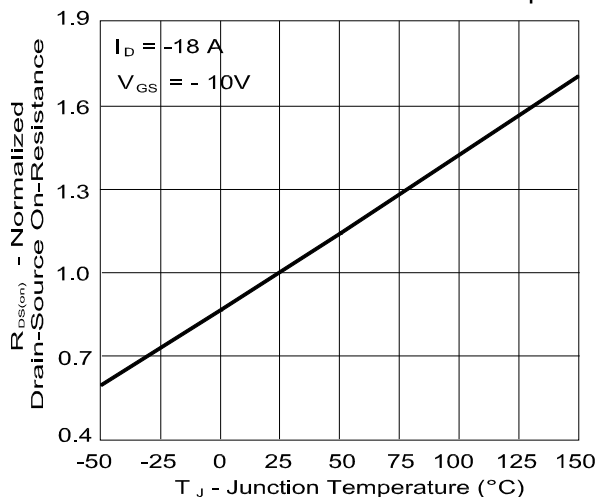
On-Region Characteristics



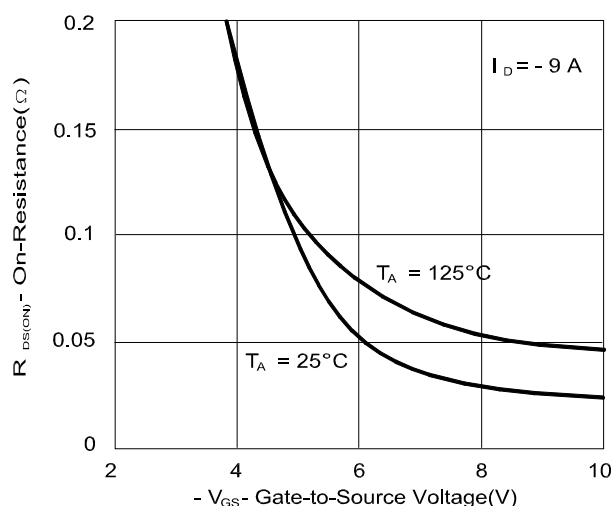
On-Resistance Variation with Drain Current and Gate Voltage



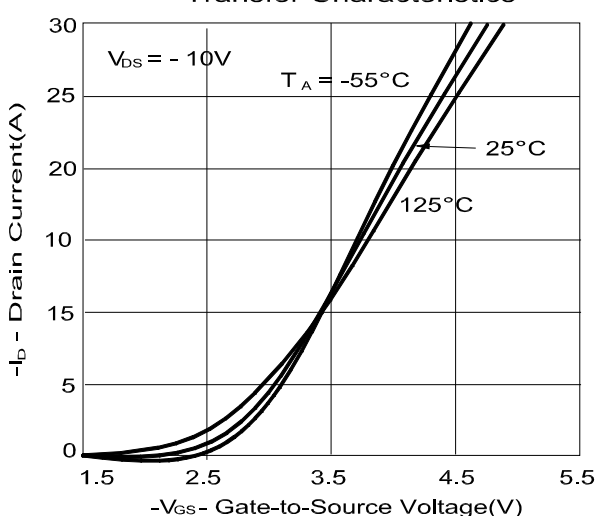
On-Resistance Variation with Temperature



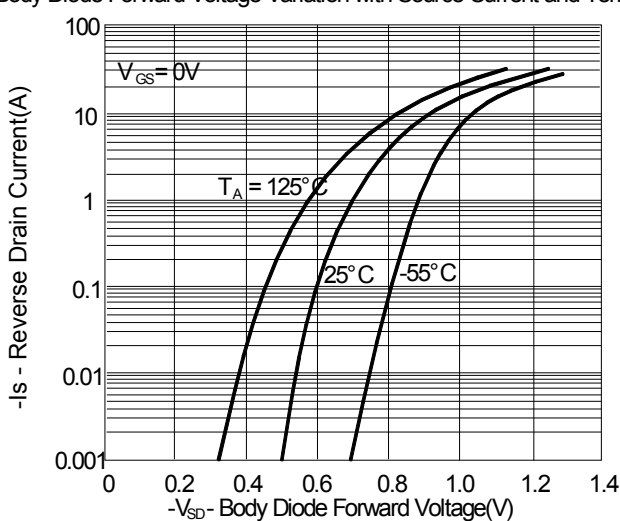
On-Resistance Variation with Gate-to-Source Voltage



Transfer Characteristics



Body Diode Forward Voltage Variation with Source Current and Temperature



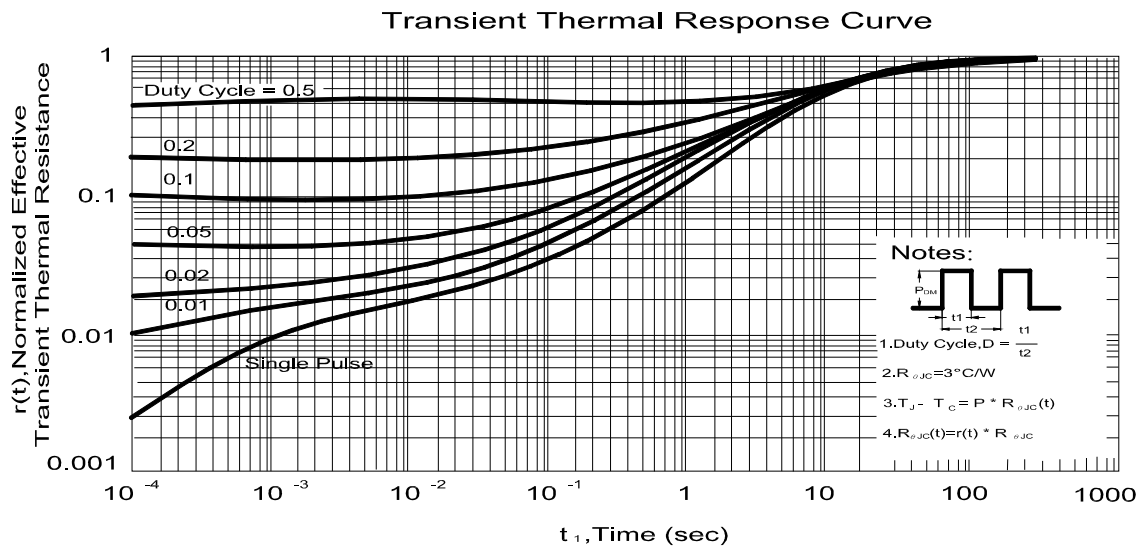
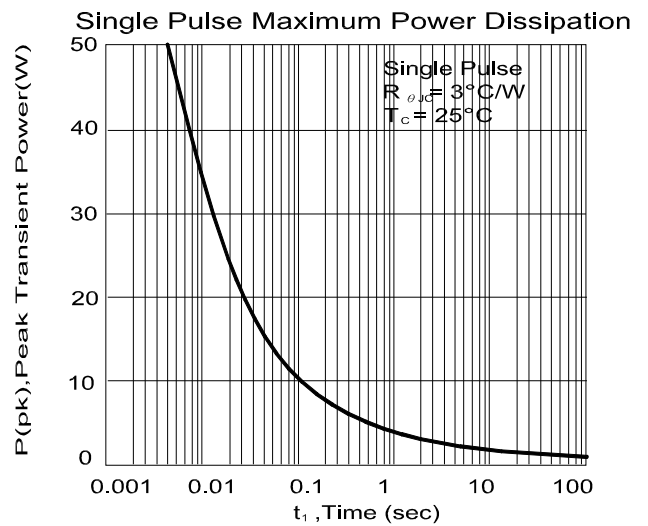
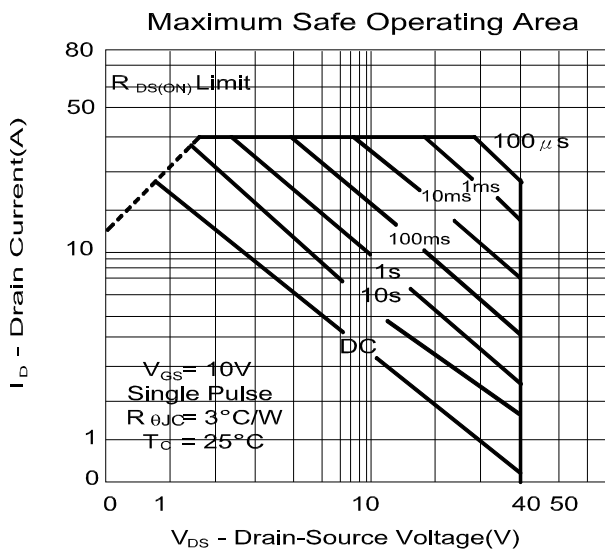
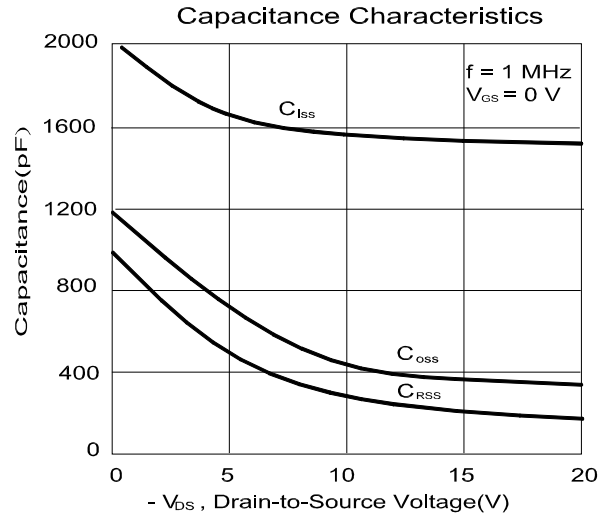
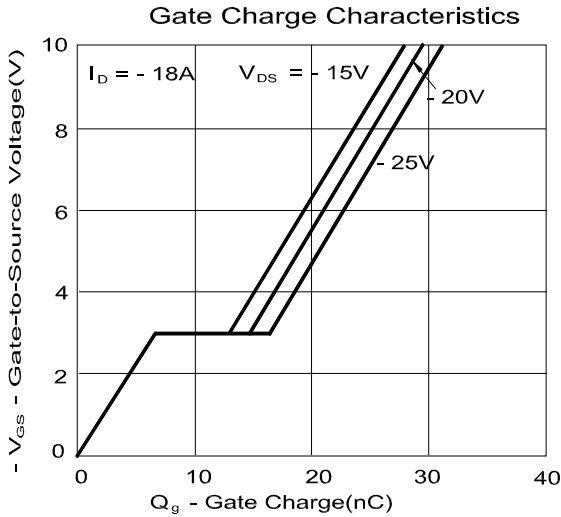


Figure 1

Gate Charge Test Circuit

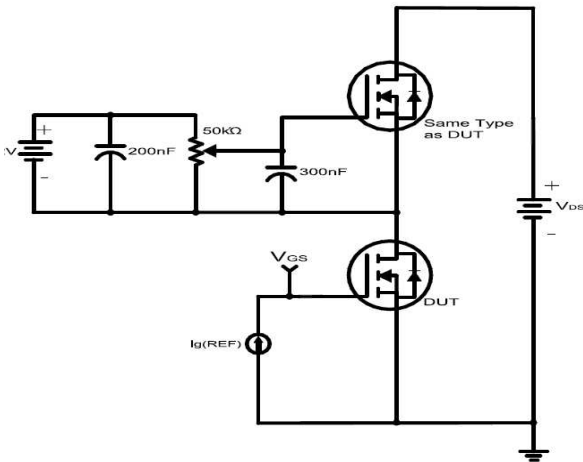


Figure 2

Gate Charge Waveforms

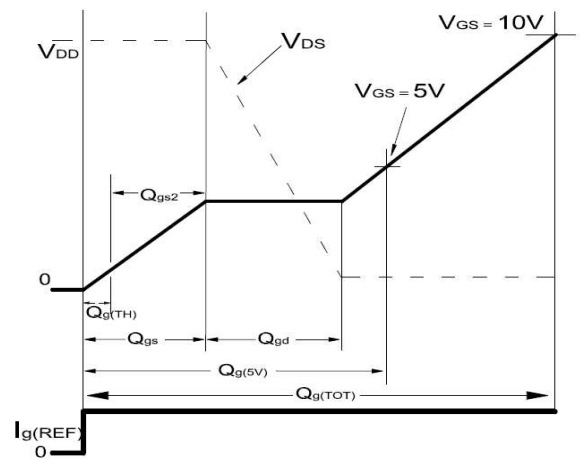


Figure 3

Switching Time Test Circuit

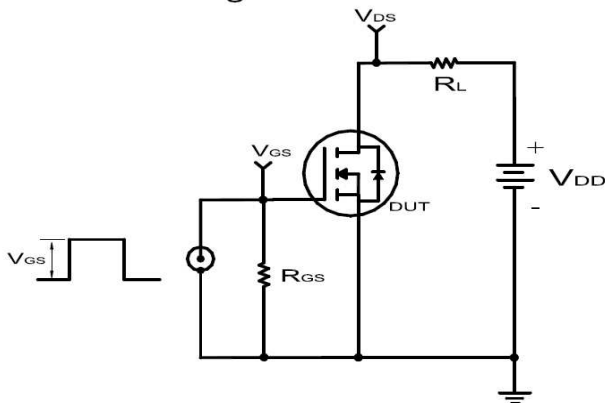


Figure 4

Switching Time Waveforms

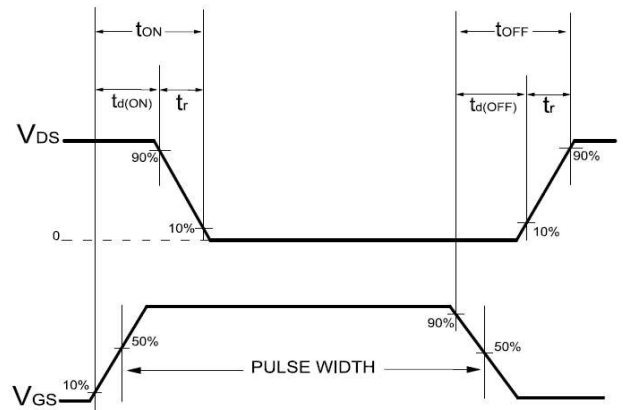


Figure 5

Unclamped Energy Test Circuit

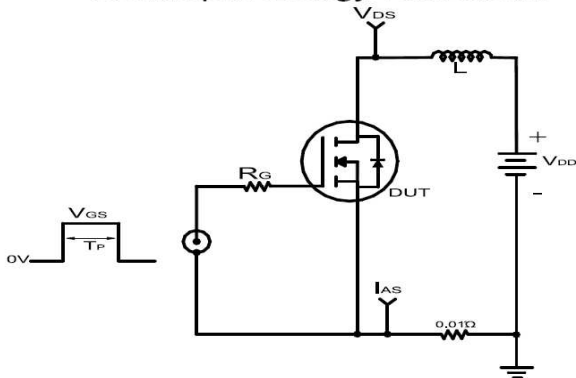


Figure 6

Unclamped Energy Waveforms

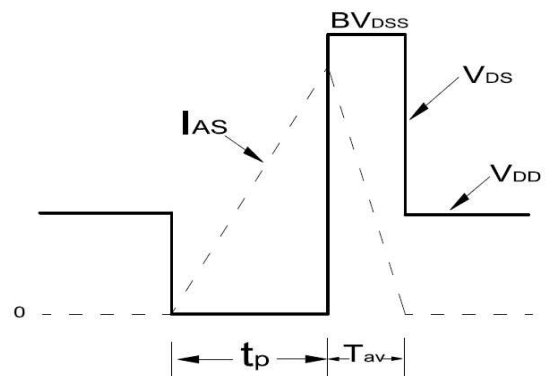


Figure 7
Diode Recovery Test Circuit

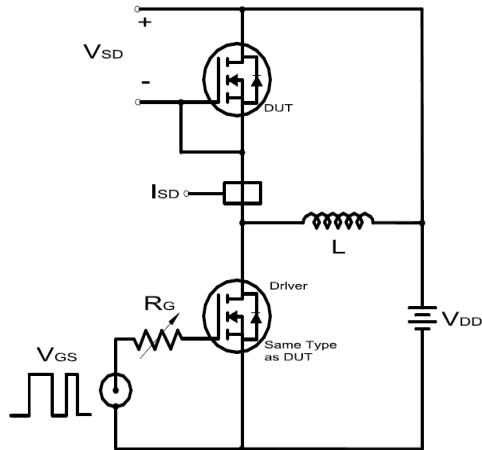
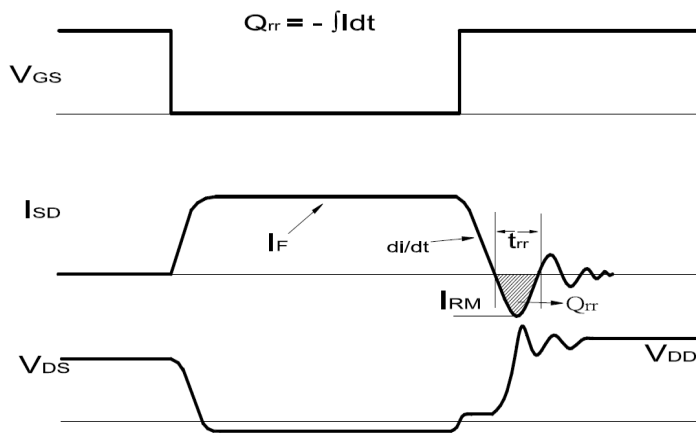


Figure 8
Diode Recovery Test Waveforms



TO-252 (DPAK) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	8.9	9.5	10.4	H	0.8	1.27	2.03
B	2.19	2.3	2.435	I	6.35	6.6	6.8
C	0.35	0.5	0.65	J	4.8	5.34	5.5
D	0.89		1.5	K	0.5		1.5
E	0.35		0.65	L	0.4	0.76	0.89
F	0.0		0.23	M	3.96		5.18
G	5.4		6.2	W	3.38	3.58	3.78

