

/ Descriptions

TO-252 P
P-CHANNEL MOSFET in a TO-252 Plastic Package.

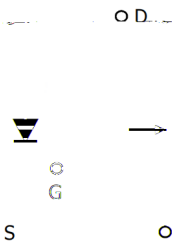
/ Features

$R_{DS(on)}$ C_{rss} AEC-Q101
Low $R_{DS(on)}$, low gate charge, low C_{rss} , fast switching, Trench Technologies, Qualified to AEC-Q101 Standards for High Reliability, HF Product.

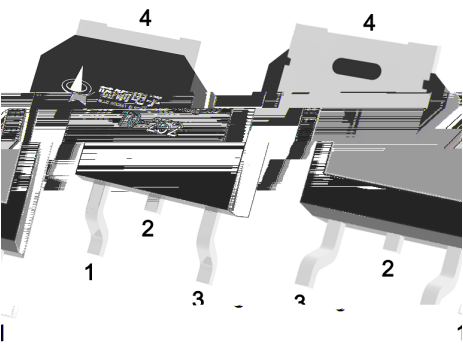
/ Applications

DC/DC
Suited for low voltage applications such as automotive, DC/DC Converters, and high efficiency switching for power management in portable and battery operated products, Meet the stringent requirements of automotive applications.

/ Equivalent Circuit



/ Pinning



PIN1 G PIN 2 D PIN 3 S PIN 4 D

/ Marking

See Marking Instructions.

/ Absolute Maximum Ratings(Ta=25)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V _{DSS}	-40	V
Drain Current		I _D (T _c =25℃)	-40	A
Drain Current - Pulsed		I _{DM}	-115	A
Gate-Source Voltage		V _{GS}	±20	V
Avalanche Current		I _{AS}	24.5	A
Single Pulsed Avalanche Energy（L=0.5mH）		E _{AS}	210	mJ
Power Dissipation		P _D (T _c =25℃)	52	W
Storage Temperature Range		T _{stg}	-55～150	
Thermal Resistance-Junction to Ambient	t ≤ 10s	R _{θJA}	20	℃/W
	Steady-State		50	
Thermal Resistance-Junction to Case	Steady-State	R _{θJC}	2.4	

/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V$ $I_D=-250\mu A$	-40			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-40V$ $V_{GS}=0V$			1.0	μA
Gate-Body Leakage Current Forward	I_{GSS}	$V_{GS}=\pm 20V$ $V_{DS}=0V$			± 0.1	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=-250\mu A$	-1.0	-1.7	-2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-10V$ $I_D=-20A$		13	15	m Ω
		$V_{GS}=-4.5V$ $I_D=-10A$		17	30	
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_S=-1A$			-1.2	V
Gate resistance	R_g	$V_{GS}=0V$ $V_{DS}=0V$, $f=1MHz$		6.5		Ω
Input Capacitance	C_{iss}	$V_{DS}=-25V$ $V_{GS}=0V$ $f=1.0MHz$		2680		pF
Output Capacitance	C_{oss}			1150		
Reverse Transfer Capacitance	C_{rss}			870		
Total Gate Charge	$Q_g(10V)$	$V_{GS}=-10V$ $V_{DS}=-20V$ $I_D=-20A$		42		nC
Total Gate Charge	$Q_g(4.5V)$			18.6		
Gate Source Charge	Q_{gs}			7		
Gate Drain Charge	Q_{gd}			8.6		

/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=-10V$ $V_{DS}=-20V$ $R_L=1\Omega$ $R_{GEN}=3\Omega$		9.4		ns
Turn-On Rise Time	t_r			20		
Turn-Off Delay Time	$t_{d(off)}$			55		
Turn-Off Fall Time	t_f			30		

/ Electrical Characteristic Curve

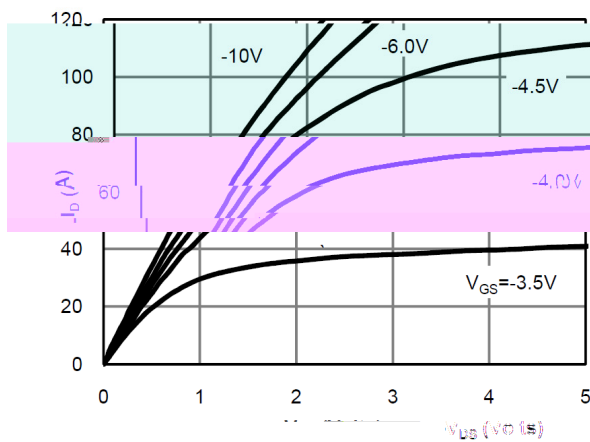


Figure 1: On-Region Characteristics

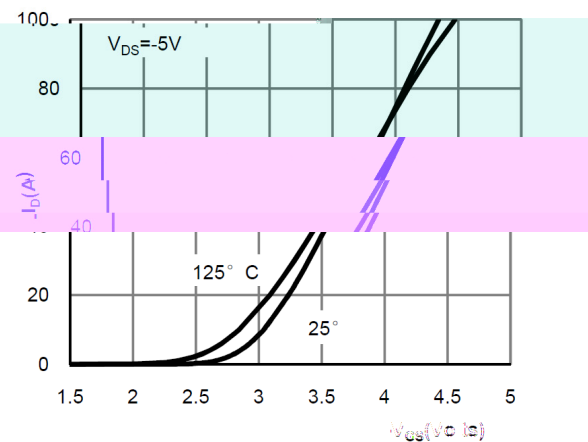
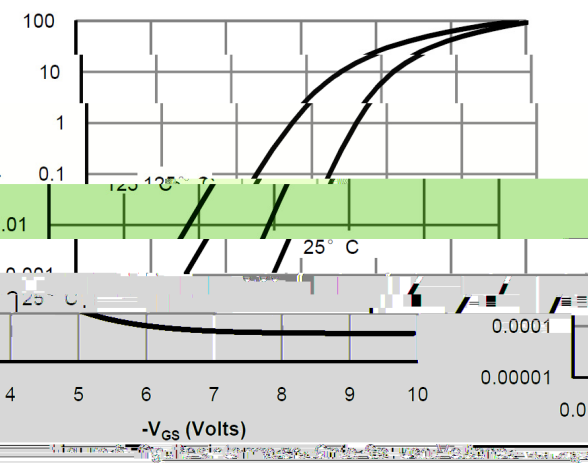
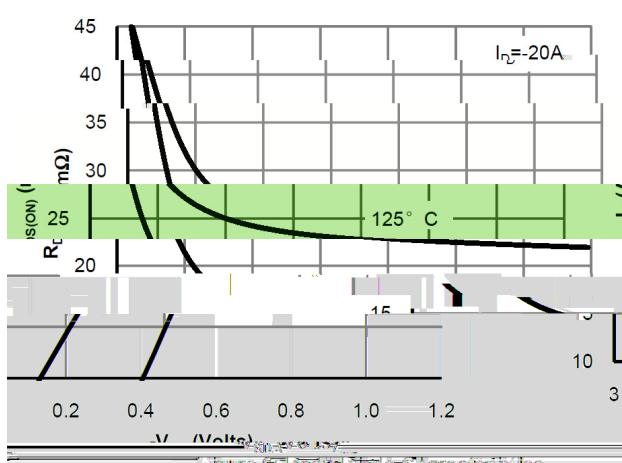
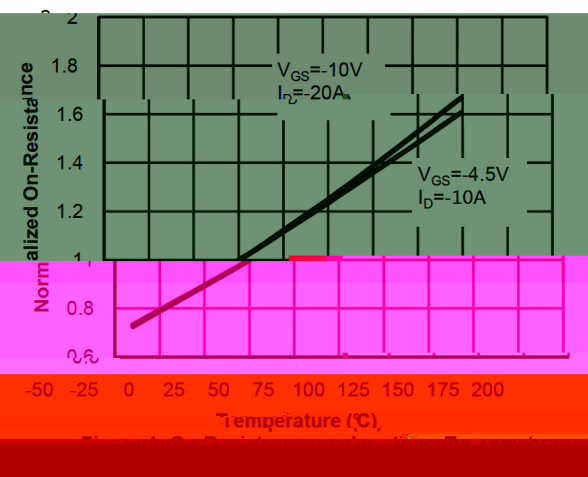
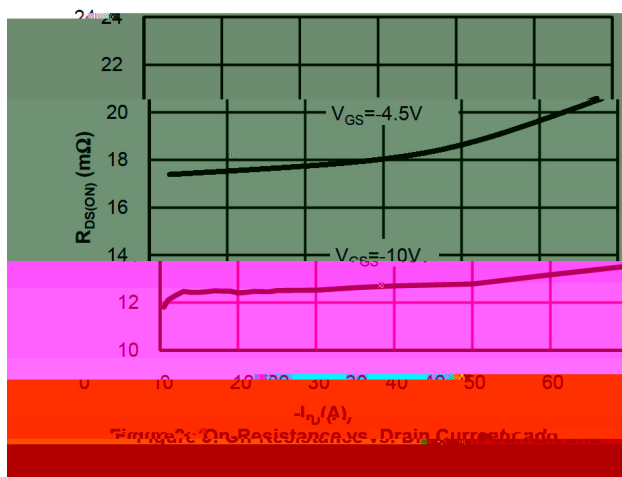


Figure 2: Transfer Characteristics



Electrical Characteristic Curve

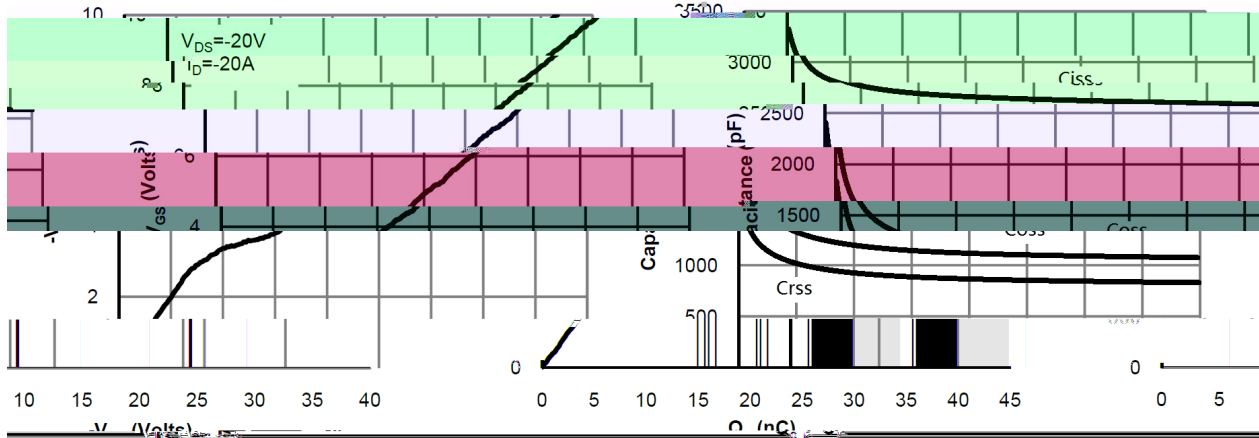


Figure 8: Capacitance Characteristics

Figure 9: Gate Charge Characteristics

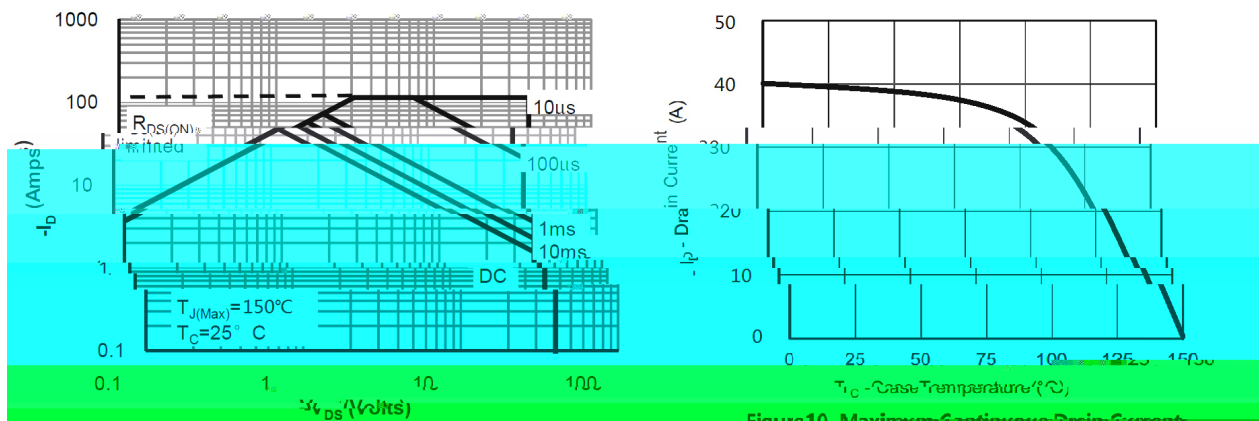


Figure 10: Maximum Forward Biased

Figure 11: Maximum Continuous Drain Current

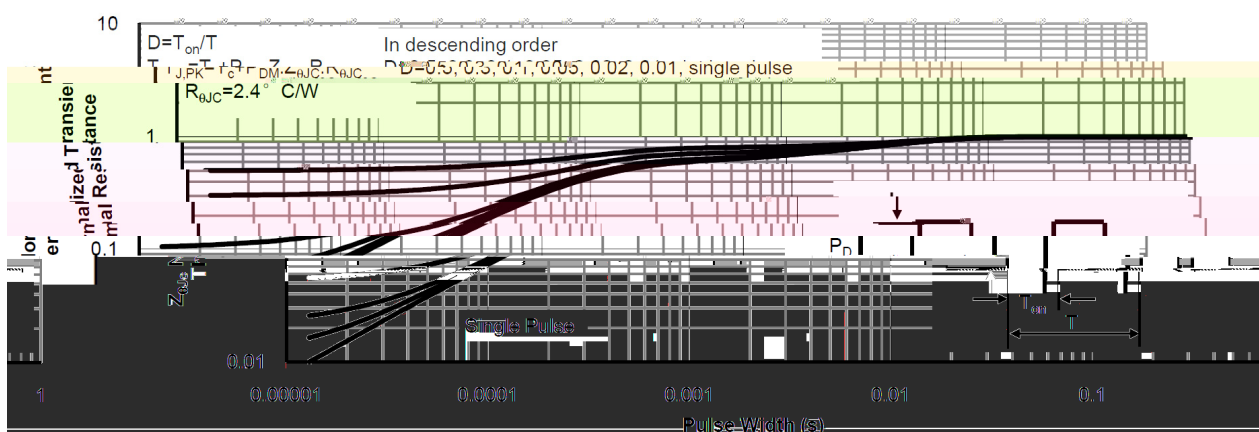
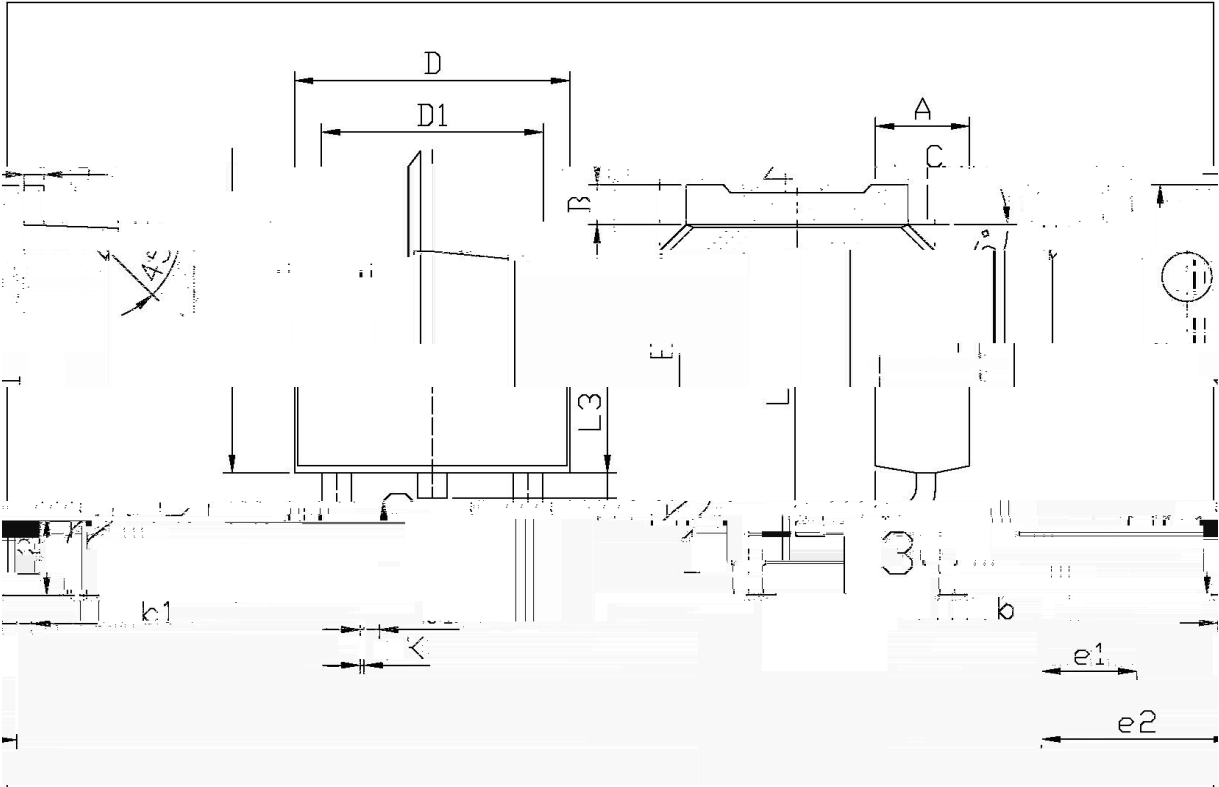


Figure 12: Normalized Maximum Transient Thermal Impedance

/ Package Dimensions

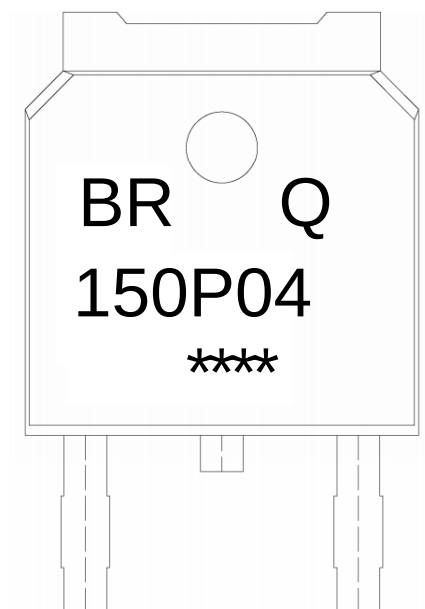


单位: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	6.25	6.75	F	5.08	5.98
B	0.95	1.25	e1	2.24	2.34
C	0.76	0.85	e2	9.85	10.35
D	0.45	0.55	L1	1.70	2.00
D1	0.60	0.90	L3	6.45	6.75
E	5.50	6.00	L	5.10	5.70

TO-252

/ Marking Instructions



BR

Q

150P04

Note:

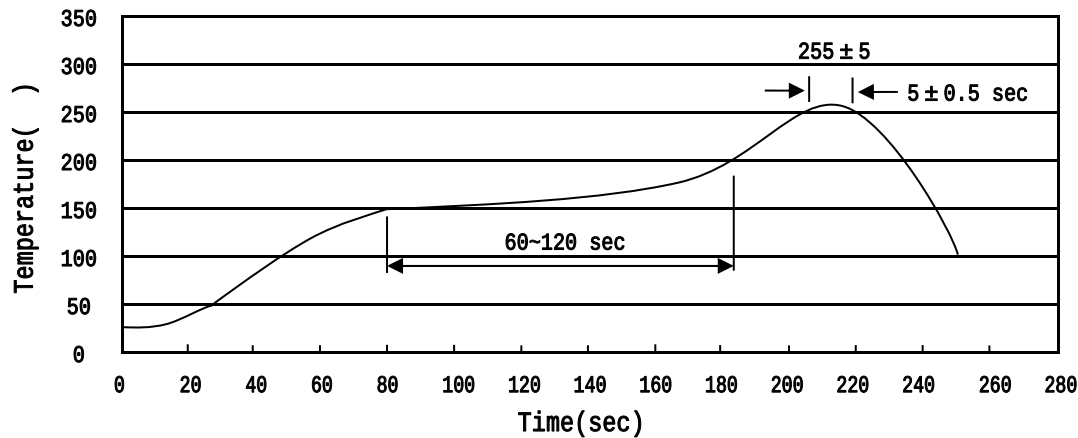
BR: Company Code

Q: Automobile halogen-free product Code

150P04: Product Type Code.

****: Lot No. Code, code change with Lot No

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



Note:

1. Preheating: 150~200 °C, Time: 60~120sec.
2. Peak Temp.: 255±5 °C, Duration: 5±0.5sec.
3. Cooling Speed: 2~10 °C/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 mm ³)		
	Units/Reel /	Reels/Inner Box /	Units/Inner Box /	Inner Boxes/Outer Box /	Units/Outer Box /	Reel	Inner Box	Outer Box
TO-252	2,500	2	5,000	6	30,000	13" × 16	360×360×50	380×335×366

/ TUBE

Package Type	Units					Dimension (unit mm ³)		
	Units/Tube /	Tubes/Inner Box /	Units/Inner Box /	Inner Boxes/Outer Box /	Units/Outer Box /	Tube	Inner Box	Outer Box
TO-251/252	75	48	3,600	5	18,000	526×20.5×5.25	555×164×50	575×290×180

/ Notices